THE JOURNAL
OF THE
ROYAL UNITED SERVICE INSTITUTION.

VOL. XLIV. APRIL, 1900. No. 266.

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GOLD MEDAL PRIZE ESSAY.

Subject:

"CONSIDERING THE CHANGES MADE IN NAVAL CONSTRUCTION DURING THE PAST TWENTY YEARS, AND IN VIEW OF THE EXPERIENCE GAINED DURING THE CHINA-JAPANESE AND SPANISH-AMERICAN WARS, WHAT ARE THE BEST TYPES OF WAR-VESSELS FOR THE BRITISH NAVY, INCLUDING ARMOUR, ARMAMENT, AND GENERAL EQUIPMENT FOR SHIPS OF ALL TYPES?"

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"*Certum pete finem.*"

INTRODUCTORY REMARKS.

TO decide correctly as to the type of ship best adapted for a given purpose, it is necessary to begin by considering the nature of the work that will be required of her in carrying this purpose into effect. A definite line of naval policy should, therefore, be determined on by any country holding aspirations to power on the seas, as the basis on which to work in building its ships of war.

For countries aiming at the defence of their coast-line and territorial possessions only, these ships will meet their requirements, if constructed for coast defence pure and simple, without high sea-going qualities. For other countries, restricted for various reasons in their expenditure, it is only possible to undertake the construction of the cheaper forms of naval defence, which lie in torpedo-boats, etc. For our own country, however, the first of these objects is insufficient for the national existence and welfare; and we are, fortunately, in a position which frees us from the limitations of the second. The defence of our territory and coasts from invasion is only a part of the work requiring to be carried out by the Navy; for, if the seas themselves cannot actually be called British territory, more than half the traffic they carry is British property, which must also be secured at all costs from molestation by an

enemy. It is only possible to combine these two duties by acting as if the seas *were* British territory, driving such an enemy off them into his own harbours, and forcing the scene of operations back on to his own coast-line.

The true line of naval policy for this country is, therefore, very clear; and the fundamental necessity for the ships built to carry it out must be possession of qualities enabling them to keep the seas in all kinds of weather. For a ship built with the idea of defence from invasion or bombardment only, this is obviously unnecessary, for in bad weather she can retreat for shelter to her nearest port, knowing very well that, until it moderates, neither of these undertakings can proceed with any likelihood of satisfactory results. On this point other countries have, therefore, an advantage over us, for a coast-defence ship is relieved of the great demands for freeboard, buoyancy, and coal stowage, which must be considered in the designs of a sea-goer; and it is consequently possible to put equally good fighting powers into a smaller and cheaper vessel.

This drawback, however, is one to which we must simply be content to submit, for we have no alternative. Fortunately, as already stated, we are perfectly capable of meeting the additional expense of building the larger class, and of late years have adhered to the rule that coast-defence ships should have no place in the Service; but the point is very frequently lost sight of by amateur critics when comparing with ours the relatively larger armaments, etc., carried by foreign craft.

If, then, it is decided that the defence of the Empire must be maintained on the enemy's coasts, so as to include also the defence of the sea, and that, therefore, the ships to whom these duties are entrusted must primarily possess good sea-going qualities, then the next thing to be considered is what they require towards adapting them for fighting purposes as well.

The successive stages of development in the designs of battle-ships of late years have been reached by the primary necessity of producing vessels able to carry modern ordnance most effectively, and at the same time to suffer least from its use by an enemy. The commencement of the demand for resisting power in a ship arose from the introduction of explosive projectiles; and as guns have gone on constantly increasing in size and destructive force, so means of meeting their effects have also been constantly in requisition.

As the result of these requirements the modern battle-ship has gradually come into existence, and when, with her armament, she is taken as a whole, there are signs that in certain directions something like finality of development has been attained; for, although the ballistic power of guns still increases, their proportions in the matter of weight, which have reached in several patterns to over 100 tons, are undergoing a re-action, while the actual displacement tonnage of the vessel herself, which advanced to the 14,000 tons of the "Royal Sovereign" class in 1890, has since then remained practically stationary, and, in fact, in cases actually receded.

It would, however, probably be correct to say that it was as much the effort to obtain the resisting powers produced by the ability to carry armour, as the offensive powers obtained by the most effective disposition of guns, which by degrees modified ships to the types of the present day; and, as the increased efficacy of armour has been arrived at more from the results of a series of successful experiments and discoveries—which may be indefinitely continued—in the chemical treatment of materials during the process of manufacture, than from any merely mechanical improvement of design, it is impossible to assert that the presently accepted type of ship will not be quite obsolete twenty years hence.

It happens to be the case, however, that, besides the direct power of offence and defence when actually in the presence of an enemy's battle-fleets, which is the attribute of primary importance, a Navy has other requisites to be considered. It ought also to possess the inherent faculty of applying these forces at the right moments, by being able to rely upon its own abilities to reconnoitre and acquire information of strategical and tactical value; and, lastly, it ought to be able to protect its own mercantile marine from the lesser operations of an enemy in a purely commerce-destroying line. These requirements necessitate the construction of a class of vessel in which speed must be the paramount object; and thus originated the frigate of former times and the cruiser of to-day. The cruiser, therefore, is the second necessity of a fleet as at present constituted, and complementary to the battle-ship in forming the whole.

As a useful auxiliary, although not a necessity to a fleet, comes the type of small craft specially built to utilise the Whitehead or other locomotive torpedo, which has come into existence as a direct result of the invention of these weapons. Broadly speaking, this class includes torpedo-cruisers, torpedo-gunboats, destroyers, and torpedo-boats. With them, as with the cruiser, speed is almost everything, but in their case mainly as a means of enabling them to get, unobserved or undamaged, within effective range of their torpedoes. This general class, however, is practically limited in its operations to coast and harbour defence work, and cannot, to any great extent, be instrumental in framing the strategy of a war connected with the object of obtaining command of the sea, although they may modify its conduct to some extent.

These three general types, then, form the elements of all completely and properly constituted fleets of the present day, although their respective numerical proportions are varied accordingly as each type happens to be more or less required by the various naval policies of different countries.

The individual duties in war of the three types are fairly clearly defined, and the differentiation of the types should therefore be distinct in theory, but as a matter of fact this is far from being the case, from a variety of causes. There are cruisers afloat which are almost battle-ships, and so-called battle-ships which are little more than cruisers, and a very

indefinite line exists between the smaller cruisers and the larger torpedo-gunboats. This is detrimental in many ways to general efficiency, for there can be no question that homogeneity in each type gives a fleet possessing it immense advantages. If the battle-ships of a fleet have the same speed and manœuvring capabilities, their combined movements are greatly facilitated; if its cruisers have the same coal stowage and speed in a sea-way, they can act in conjunction without hampering each other; if the artillery has uniform power it can all be brought into action at its most effective range, and so on. As regards ammunition, the desirability of keeping the number of different calibres at a minimum must be obvious.

Accepting the fact, however, that some class or another of sea-going battle-ships and cruisers, assisted by smaller torpedo craft, must provide the requisite elements of force required to carry out the national policy at sea, it becomes expedient to examine carefully the points which, when combined, go to produce the most effective pattern of a ship of each class.

The conditions laid down for the essay state that the experiences gained by the results of the China-Japanese and Spanish-American wars are to be called in, to assist in arriving at opinions; but although there are valuable lessons to be derived from each, sometimes of a new character, yet care must be exercised in taking these as leading to conclusive or infallible deductions. In the first place, the fleets on the vanquished side in each case were labouring under the disadvantages of a gross maladministration, which led to neglect and depreciation of *matériel*, and to inefficiency and incapacity of *personnel*. Secondly, their tactics if they had any definite purpose in them at all, were of the poorest description, while their general strategy and ideas of combination can only be described as absolutely fatuous. In spite of this, however, some warnings of a most unmistakable nature are presented; and the writer, keeping these in view, proposes to consider now each type successively in order of precedence as regards their respective power, commencing therefore with the battle-ship.

PART I.—Battle-ships.

As far as the writer's views go, a battle-ship for our own Service should be constructed to meet the following requirements in the sequence given :—

a. Seaworthiness.
b. Large calibre gun power.
c. Protection.
d. Speed.
e. Coal stowage.
f. Medium and light calibre gun power.
g. Ram and torpedo power.

And this order has been arrived at for the reasons now to be shown.

a. Seaworthiness.—To anyone who admits that the conditions of the Empire imperatively demand that the seas shall be kept clear of an enemy's ships, it is probably quite unnecessary to argue that this quality must exist above all things in British ships of war, because it is evident that to keep an enemy off the seas you must be able to keep on them

yourself. Seaworthiness in a fighting-ship, for this reason, should comprise not merely the power to remain safely at sea during any weather, but, if possible, the power to use some at least of her weapons effectively in any weather. To provide for this, she should carry her guns at a good height above the water, and on a steady platform. These two demands work against each other somewhat, as elevation of weights produces reduction of stability; but that they can be combined is proved by the performances of our most recent classes of battle-ships, which in this respect are acknowledged to have no rivals. It has been demonstrated repeatedly by practical experience that bilge keels are a great help towards reducing the motion of a ship, and although they do perhaps tend slightly to detract from speed, their steadying effects more than compensate for it. A high free-board and forward "sheer," or a raised forecastle, assist a vessel greatly, of course, in steaming head to wind, and these features are to be found in most of our later types of all classes. In fact, there can be no doubt that as good all-round sea boats the ships built of recent years for our Service have no equals in any other, and as such they will be taken in this essay as the types best suited on that particular point for our needs.

b. Large Calibre Gun Power.—In the possession of heavy calibre artillery, and consequently increased offensive power in a concentrated form, must lie the chief distinction between the battle-ship and the cruiser. Unfortunately on this very point the lesson of the two wars in question teach us very little of a positive value. Indeed, they might seem to suggest that the day of the heavy gun is past in favour of the medium or light quick-firer, because at Santiago the fourteen guns in all of 12-inch and 13·5-inch calibre carried by the American battle-ships only succeeded in getting home twice, to whatever this may have been attributable; but the Americans had an easy task, as they were only engaged with cruisers for whose powers of resistance the lighter Q.F. guns were more than a match. Had the Spanish vessels been first-class battle-ships, the action would probably have been decided ultimately by the heavy ordnance of one side or the other.

The apparently negative results again of the large expenditure of heavy calibre ammunition on both sides at the Yalu do not disprove the general axiom, while the state of the Chinese battle-ships after the engagement indirectly helps us to accept it. The writer was informed by an English officer, who was on board the "Ting Yuen," that neither she nor her sister ship had received any serious damage throughout, although riddled by Q.F. guns in their unprotected parts; and but for the fact that their magazines were nearly empty, and their crews much reduced, they were practically just as efficient for fighting purposes at the close of the action, after five hours' hammering, as they were at the beginning, because no heavy shell had struck a vital part. Apart from the use of ram or torpedo, therefore, or the chance of fire breaking out, it is obvious that such vessels are only to be finally put out of action by projectiles which can be driven home anywhere; and ships built to match them must therefore, as a matter of necessity, carry heavy guns for the purpose.

There seems at present however to be a somewhat general consensus of opinion that guns can be too heavy as well as too light, and that a certain medium is the best. The recent experiences of the very heavily armed American battle-ships in bad weather appeared to show that they were doubtfully seaworthy through sheer overweighting, and this with perhaps additional reasons has induced the Americans to modify the size of their largest types, in much the same manner as we have done. The last report of the United States Bureau of Naval Ordnance contains amongst others the following remarks: ". . . heavy guns in turrets must be recognised as a necessity, but the question as to the calibre to be employed is a subject for serious consideration, and one upon which the Bureau has bestowed much thought. . ." "Development of the 12-inch gun has been so great, and its power so much increased, that the Bureau is of opinion that hereafter it will be the maximum calibre; that it will be advisable to install them on future battle-ships, and that these should be supplemented by an auxiliary battery of 6-inch Q.F. guns, in casemates, etc."

If this opinion is sound, our recently built battle-ships are probably the best equipped in the world, for the 12-inch wire gun of our latest design is a weapon of very superior power, while not undesirably heavy, and the present pattern of mounting is strong, easily handled, and as simple as can be expected.

It is true that the Americans are much in favour of electrically worked mountings, and these may perhaps have advantages, especially as regards repairing facilities; but on the other hand, the repeated references to the failure of electric hoists, etc., in the reports of their own officers after the war, constitute a very noticeable fact; and until we have more experience of our own to go upon, electricity is not considered here as having sufficient arguments in its favour to supersede hydraulic motive power altogether.

Our system of disposing guns in pairs in two barbettes, instead of singly in fours, saves a great deal in weight and duplication of machinery, and a clear proof that its advantages are recognised lies in the fact that almost all foreign Powers are gradually following our lead in the matter. This, therefore, as it stands is the type of heavy armament which the writer would select as best adapted to a British battle-ship.

c. Protection.—A defeated ship is one that has been incapacitated from further offensive action, for the time being at any rate. This is the consummation her enemy must endeavour to reach throughout, and, provided she fights on as long as she has the power, can only be accomplished by rendering her weapons useless or sinking her outright. The former may be effected either by causing direct damage to the weapons themselves, paralysing loss to the crew which handles them, or fruitless exhaustion of their ammunition. Damage to her machinery or steering arrangements is only a step to this end, although one of the surest that can be taken, for it leaves her at such a disadvantage that the rest is rendered an easy matter.

Next, therefore, to having the power of inflicting these injuries on an opponent, a battle-ship should be so constructed as to prevent

them from being inflicted on herself. Her own guns, by supplying her with an "offensive defence," act partly towards this, but are not all-sufficient for the purpose. Armour-plating of some sort ought to form part of her equipment, and the immunity from serious damage to *matériel* experienced by the Chinese ships already referred to, is only one of many instances which go to prove its great value in preserving a vessel's offensive powers in action.

In this particular case, however, its location was such that it was only equal to preserving them in part, for the crews suffered heavily, which in conjunction with the failure of ammunition forced the ships to retreat beaten to Port Arthur. In other words, they were defeated ships, although neither sunk nor even materially injured on the water-line, because their weapons had been rendered ineffective, and they were consequently in such a condition that they would have fallen an easy prey had the winners chosen to follow up their success.

At Santiago again we see a recurrence of the same thing. Although with water-lines practically untouched the Spanish cruisers were driven ashore as shattered wrecks, the primary cause of defeat arising from the demoralising loss to the human element in their equipments. These are events calling for close attention.

The chief, and unavoidable, drawback to armour, severely restricting its use on floating structures, is its great weight. This restriction renders it a matter of the utmost importance, so to distribute it, that the protection afforded may be given where most needed, or it will be a dead load encumbering the ship and detracting from her efficiency. Broadly speaking, it has been customary hitherto to place it over the water-line first—in belted cruisers often there only—and then, if the ship could carry it, over the armament and spaces occupied during action by her crew. This indicated a prevailing idea that a ship was in more danger of succumbing to blows on the former than on the latter; but whether this notion was or was not in accordance with fact in the past, it can scarcely be considered as otherwise than erroneous in the present. The American report and analysis of the action at Manila concludes with the very noteworthy expression of opinion that ships are more likely in the future to suffer defeat through loss in *personnel* than from damage to *matériel*, which the general results of the war seem fully to bear out.

With this before us, we are constrained to admit, that the whole question of the value of water-line protection, relatively to other protection, is raised, and requires most careful and unprejudiced scrutiny. In the first place, we have the undoubted fact that the water-line of a ship is the most difficult thing of all to hit, and a very trifling error in range, and consequent elevation will cause a miss in the attempt. Moreover, if the error lie in an under-estimation of the range, the projectile will fall short and, except for a chance ricochet, will miss the enemy altogether. This, if persisted in, must lead to a useless waste of ammunition, and, when quick-firers are at work on both sides, of very valuable time, for the enemy might already be getting in decisive work by concentrating his attack on the easier and perhaps more vulnerable target offered by the

other's battery and sides. Captain Mahan, in his article in the *Times* of 1st March, 1899, remarks that "war cannot be made without taking risks, of which the greatest is misplaced or exaggerated carefulness." If armour thick enough almost to resist the impact of any sized projectile is piled up along a vessel's water-line as hitherto, the plating which covers men and guns must be restricted; or, in other words, the thing which seems least likely to suffer in action will receive protection at the expense of that which is likely to suffer the most.

This seems at least open to question, whether, in such a case, this very risk of "misplaced or exaggerated carefulness" is not incurred, the anxiety to render a ship unsinkable causing an omission of the necessary steps to provide against, her defeat in other ways perhaps more easily accomplished. It is, of course, true that a *single* blow on the water-line, when the projectile is heavy enough, must, as a rule, cause a more serious injury than a *single* blow on the upper works, but not more so than a rapid succession of them, and, as it is infinitely less probable, should be guarded against last.

At Santiago, the Americans fired scores of rounds from their heavy 12- and 13-inch turret-guns, and only hit the Spaniards twice altogether with that class of weapon. It is quite possible that this may have been due to sheer bad gunnery, but even an improvement of cent. per cent. in the practice would only give four hits all told. If, then, scores of rounds are required to get four hits on four ships, or an average of one apiece on the target presented by the ship's whole side, it would be necessary to expend hundreds to make sure of eventually landing on her water-line.

To the writer, therefore, it certainly appears that the risk of sinking or disabling a ship in this way is of so remote a nature that we should be justified in reducing the thickness and weight of water-line belting, for the sake of the urgent necessity now arising of giving better protection elsewhere. We are constantly being told that a battle-ship must always be a compromise, to some extent at least; and this seems to be the arrangement by which the ship will suffer least from the sacrifices which the compromise demands. The heavy water-line belts which the Spanish cruisers carried were of no avail in saving them from rapid and effectual destruction by the fire of medium and light batteries. Had the hundreds of tons of what proved to be useless armour been employed in sheltering their men and guns, the action might, at any rate, have been greatly prolonged.

If, however, it must be admitted that the chances of a heavy shell striking just between wind and water are very remote, as regards the lighter projectiles, this does not hold good on account of their mere numbers. When a modern action is in full swing, the ships engaged are exposed to a perfect hail of the latter; and, although they cannot, except by extraordinary luck, effect serious damage when there is anything of a protective deck, they may still flood compartments above it, and cause much trouble in other ways. On the strength of this, and as a mean between the opposite extremes of opinion on the

subject, the writer would suggest that a belt of 4- or 5-inch plating is all that appears to be practically necessary, thickened only, if it must be so, just abreast the machinery. Such a belt would resist the impact of chance light projectiles, and the very great saving of weight might be applied to thickening the armour on the sides, casemates, and gun-shields, etc.—in fact, to all parts which experience now seems to point out as those on which the brunt of the enemy's destructive efforts will fall.

But if the risks to which the water-line is exposed are apparently small, those incurred by the guns and their crews are undoubtedly very great, and, as they form the most important part of a ship's offensive power, they cannot have too much protection, provided always the ship can carry the weight. This, of course, also applies to the ammunition-supplying arrangements and the men working them, without which the guns are useless.

As regards, then, the safety of the heavy guns and their mountings and mechanism, the system of steel hoods over armoured barbettes, as used in all our most recent battle-ships, seems, as far as the writer is capable of judging, to be the best that can be devised; and a 10-inch hood over a 12-inch Krupp steel-plated barbette ought—since the face-hardening processes have been successfully carried out with heavy as well as medium armour—to be quite sufficient for the purpose, representing as that would, approximately, twenty-five and thirty inches of wrought-iron protection.

The protection of the medium and light calibre Q.F. batteries should properly be referred to after the subject of medium calibre gun power which comes later, as it is considered of secondary importance to the guns themselves, on the principle already given as embodying the writer's views. As it is desirable, however, to simplify discussion by completing the treatment of each subject as a whole, it will be dealt with here. Briefly, it may be said, that when the penetrating powers of modern medium calibre ordnance as used now by all nations are considered, the secondary batteries of any vessel ranking as a first-class battle-ship, together with their arrangements for supplying ammunition, and the men working them, should be sheltered by at least eight inches of Harveyized steel. With Krupp steel this might be slightly reduced, and with either could be carried by thinning the water-line belt.

Besides, however, the direct protection afforded by armour-plating, there is a species of indirect protection which can be provided in a ship, especially to the human element in her equipment, by ensuring the absence of materials which may assist the enemy by adding to the destructive effect of his projectiles.

This is a lesson which was enforced with tremendous emphasis in both the wars which form the subject of study, but which seems almost entirely to have escaped notice, although anyone reading the accounts of the effects of the shell fire on light upper works, etc., can hardly fail to remark it. At present, however, ships are built all over the world in whose designs this most important point is entirely ignored, and whose decks are

covered with a mass of permanent superstructural fittings, all constructed of splinterable and, in some cases, inflammable, material, which are of little or no use except as conveniences in peace-time. The permanent nature of their construction might very easily be remedied by replacing the rivets, etc., by nuts and bolts; but this is never done, and the great majority of existing ships, if called upon to engage to-morrow, would therefore go into action with their fighting efficiency heavily handicapped by this fact. In most cruisers it would be almost impossible for a shell to pass over the deck at any height under ten feet without encountering some obstacle that would immediately fly into splinters. The hatchway combings are now developed into bulkheads extending often eight or nine feet upwards, enclosing nothing in particular, and merely forming ventilating trunks; the so-called "shelter" decks and platforms are erected only as extra promenading spaces, or places for stowage of gear which would be much better below; while almost all ships have two, and some even three, bridges forward, besides a couple aft. In addition to all these, there are cabins, chart-houses, hammock nettings, and boxes, bins, and a host of other fittings placed everywhere, and the gangways in many ships are covered overhead with a number of girders, crutches, and skids for carrying boats when turned in. Many of these fittings are practically superfluous; all of them are detrimental to fighting efficiency, and should, in the writer's opinion, as based on the light of the experiences afforded by these wars, be so fitted that, on the outbreak of hostilities, they could be removed by the ship's artificers, and either left at a base, or thrown overboard altogether. Hammocks could always be stowed below, or, during peace, in removable boxes on deck, and the usual fixed steel nettings replaced by rails and weather screens. Ventilation is, of course, a most necessary thing, but ventilating trunks are a source of danger in action, and should be removable. The same thing applies to seamen's heads, latrines, and w.c.'s. Sanitary considerations require that these should be placed on deck, but there should be no constructional difficulty in making them also removable, and substituting some arrangements of canvas screens on a light framework. One bridge, of a light flying design, for convenience in peace-time, or even while merely cruising in war, ought to be sufficient for the conning of any ship, if properly placed.

As regards boats, it appears that the Americans left them nearly all at the base, and judging by the complete destruction of those retained on board, they were probably right in doing so. If the boats are not required, then neither are their fittings on board the ship, and especially in some classes of cruisers. A great mass of steel and woodwork immediately over the waist guns could be got rid of with advantage. All these could be easily constructed in sets of removable pieces.

The same arguments apply to many fittings between decks, but perhaps to a lesser extent, because a shell in those parts will, as a rule, have been already exploded unavoidably by passing through the side. Much inflammable material, however, is still found below in nearly all ships, and a good deal of it in the shape of permanent fittings and furniture. If ordinary japanned tin, such as is used in the manufacture of uniform cases,

etc., was substituted for varnished or polished woodwork, the risk of fire would be much reduced.

Fixed wooden decks are another source of danger, even when hard wood such as teak is used, for it was clearly proved at the Yalu that the mere momentary graze of a passing projectile caused sufficient friction to set it smouldering freely at once. Steel decks are unsightly, but appearances are absolutely the last things to be considered in a ship built for practical work, and should never be allowed to interfere with efficiency. In the writer's opinion, the warning against putting wood or dangerous material into a ship is one of the most conspicuous lessons of these wars, and we should, consequently, so design all fittings about the decks not immediately required that they can be removed at short notice with the ship's own resources. If, when cleared for action, she showed nothing above the level of her hatchway combings except funnels, masts, guns, and conning tower, a very appreciable percentage of the shower of projectiles intended by an enemy for her benefit would fly harmlessly across her deck, instead of, as in the case of Cervera's cruisers, causing loss and demoralisation to her men.

To summarise, therefore, what the ideas of this essay would suggest as to the protective arrangements best adapted for a battle-ship of our Service, she should carry ten or twelve inches of carburised or otherwise specially treated steel over her heavy armament and all its appurtenances; if possible, at least eight inches over her secondary armament, central supplies, etc; all guns of 4·7 calibre or upwards being casemated; and a complete water-line belt of 4- or 5-inch plating doubled immediately abreast the machinery; and if the total weight of such proved more than a designer could work in, the reduction should first be made on the water-line, on the thesis here advanced, that experience now shows this to be the region where it is least required.

In addition to this, she should carry the usual 3-inch steel deck and a 1-inch deck above the citadel, but not necessarily prolonged from thence to the extremities of the ship, as in some late designs.

Further, she should be so constructed that all fittings above and below of such a nature as to be likely to increase the effect of shell fire should be easily removable unless absolutely necessary in action.

Two 10-inch plated conning towers, fairly well separated, would also be included, and some form of protection, at least shell and splinter proof, round the funnels below the upper deck.

d. Speed.—That motive powers of some sort are necessary to a ship goes without saying, and, as a *necessity*, this possession, in a greater or lesser degree, is only secondary to the possession of gunpowder, for without them she would be of no value except as a sort of fixed defence, and of hardly any at that. But it has been taken for granted by the writer that nobody is likely to argue against this, and by placing "speed" as the fourth requisite for a battle-ship, it is meant to infer *good* speed—that is, a speed of not less than eighteen knots. By *high* speed, in distinction to *good*, as dealt with later, a speed of over eighteen knots is meant,

Good speed is an attribute of very great importance to any ship. To cruisers and torpedo craft high speed is a first essential, and if of comparatively lesser moment to a battle-ship it is only because it does not in itself materially contribute towards the actual destruction of an enemy's battle-ships when she is once within range, unless, perhaps, on the very rare occasions when ramming may be resorted to. Captain Mahan, in his article to the *Times*, published 1st March, 1899, remarks on this in the following words:—"With the battle-ship, in this contrary to the cruiser, offensive power is the dominant feature. While, therefore, speed is desirable to it, excessive speed is not admissible if, as the writer believes, it can be obtained only at some sacrifice of offensive strength."

If speed does not increase offensive power however, it does almost everything else. When superior to an enemy's, it enables the possessor to bring him within range, and keep him there, whatever he may attempt to the contrary. It gives the option, in other words, of forcing or declining action, and is the foundation on which all strategical plans and combinations must be framed and carried out. It is the essence of the so-called "Fleet in Being," that is to say, it may paralyse the prosecution of an over-sea war, by preventing the aggressive belligerent from effecting the necessary initial step, of destroying the defender's ships. Finally, in action, it enables a flag officer or captain to make the best use of every kind of weapon he has. It is not however a weapon in itself, as previously remarked; nor does it act much towards the preservation of a vessel's powers while they are employed in the offensive, as armour does, and therefore it must rank after ordnance and armour as a feature in the battle-ship.

The speed of a ship is dependent partly on her under-water shape, and partly on the driving force of her propellers. The shapes which best adapt themselves to the water, are fairly well known to designers, and roughly speaking, are those in which the length is great in proportion to the area of the midship section, and in which the midship section is only carried over a short proportion of that length; in other words, where there is a fine "entry" and a fine "run." When speed is the first and only requirement, therefore, it is not difficult to obtain. But it so happens that, speaking generally, the best shapes for ensuring speed are just those most deficient in buoyancy, or carrying power, in proportion to size; and as great buoyancy is a *sine quâ non* in the design of a battle-ship, to enable her to carry her enormous load of ordnance and armour, one or other, or both, of these conflicting qualities must be modified, and the best compromise within reach effected. That however, is a matter of detail for designers, only to be arrived at by prolonged calculation and experiment, and forming too lengthy a subject for full treatment here. It will only be said, that the object to be arrived at in a battle-ship should be the production of a type capable of carrying the heavy weights necessary for high belligerent power at a speed of 18 knots at least, and this can only be attained by building very large ships similar to the "Formidable" class.

As regards machinery, the inverted triple-expansion type of engines stands at present as the accepted pattern, without a rival for all large ships, and nothing further will be mentioned on that point here, as it will presumably hold this position until some better design is forthcoming. Boilers, however, are now passing through a very radical change, owing to the gradual abandonment of the cylindrical in favour of the water-tube variety, by which, amongst other advantages, a rise in pressure from 155 to 300 lbs. has been obtained. Water-tube boilers are so well adapted in many other ways for warlike purposes, such as rapidity in raising steam, much greater facilities in repairing damages, comparatively small destructive properties if hit by a projectile, lightness, etc., that there can be no question now of their suitability to a battle-ship. Their only drawback seems to lie in a greater consumption of coal at low speeds, or with untrained stoking, than in the older type. This disappears as higher speeds are reached, especially when economisers are fitted.

e. Coal Stowage.—To enable a ship to take part in sustained operations at sea, extending over considerable periods, such as blockades or distant expeditions, a large capacity for carrying coal is a matter of great importance. It is true that ships will, in all probability, be accompanied by fast colliers, and it is also true that our own country is possessed of more fortified coaling stations than any other; but the less a fleet is dependent on these auxiliaries the better, because frequent coalings demand much time, and cause delay and interruption in the prosecution of the work in hand; and even sometimes weaken the concentrated strength of a squadron by the necessity of detaching ships. The more self-contained a ship is the better, for the less she will have to rely on her base and its line of communication.

A first-class battle-ship ought, therefore, to be designed to carry not less than 2,000 tons of coal at her full bunker capacity, and it is highly desirable that the bunkers should be so arranged that they can be filled, trimmed, and reached from the stokeholds with a minimum of labour. There are ships at present afloat in which it becomes a matter of the utmost difficulty, if not impossibility, to keep up the fuel supply at the furnaces for a long spell of fast steaming, and whose good H.P. and speed become, in consequence, to some extent wasted. At the same time, this is of second-rate importance to the actual ability to stow a certain amount somehow, for as long as it is there in the ship herself, it is only a matter of time and labour to work it up to the bunker doors, and she remains independent of extraneous assistance.

f. Medium and Light Calibre Gun Power.—Of all the lessons presented in actual battle during the two recent naval wars, none have been so instructive and interesting as those derived from studying the preeminently remarkable results of rapid medium and light calibre shell-fire, when used against unarmoured sides and structures. It was the agency by which principally, if not alone, the victorious squadrons defeated their enemies decisively at the three fleet actions fought; and in the light of the experience gained thereby it appears reasonably certain that after ships once get within range the reduction of their unarmoured parts to a

wreck by this means will be a matter of minutes for one side or the other, if not both, bringing in its train the attendant risks of fire and demoralisation of their crews. The last report of the U.S. Bureau of Naval Ordnance (which has already been quoted), says that "while heavy guns in turrets must be regarded as one of the chief characteristics of modern battle-ships, the lessons of the day indicate that the greatest execution (except against the heaviest armour) may be expected from a number of Q.F. guns of smaller calibre mounted separately in armoured casements, or in a redoubt."

But even with this effected, it by no means follows that a well-armoured battle-ship will be materially damaged in her main fighting powers, and Q.F. guns of 8-inch or less calibre can therefore only be considered in the light of very useful auxiliaries to the armament of her battle-ship opponents. They form, however, a battle-ship's best defence against torpedo craft, and her readiest and quickest means of destroying a cruiser, as practically demonstrated at Santiago.

It is here considered that, strictly speaking, no gun of more than 6-inch approximate calibre can be rightly called a quick-firer. The real criterion of quick-firing ordnance lies in the handling of the ammunition, which should not be too heavy to be easily and rapidly passed by *manual* labour everywhere from the shell-room to the bore of the gun, and no weapon throwing a projectile of much over 100 lbs. can be said to satisfy this condition. In fact, even that limit of weight sometimes proves too much to be manipulated with facility by the young ordinary seamen and boys of light or undeveloped physique so often seen, especially in newly-commissioned ships, and it was found necessary in a cruiser in which the writer served to carry out more than one change in the quarter bill for this season. Eight-inch guns form part of the secondary armament in some American ships, and have done good service, but they are not advocated here, for there is no reason to suppose that the same number of 6-inch quick-firers would not have done equally well, if not indeed much better, when their greater rapidity of fire is considered. An 8-inch gun is neither one thing nor the other, and has no clearly defined sphere of action, for while it is not powerful enough to drive through the thicker plating of a battle-ship, on the other hand it is far too slow in fire to be a good type of weapon for the expeditious destruction of her unprotected parts. Moreover, homogeneity in guns is every whit as desirable as homogeneity in ships, for the less variety there is in calibre and dimensions, the less complication and difficulty there will be in the carriage and use of ammunition and spare parts. These considerations, along with others, have induced American designers to abandon them in their recent ships, although there did exist a prejudice in their favour in some quarters.

The writer is of opinion that no battle-ship should carry more than three sizes of guns altogether, including her heaviest. The 6-inch and 12-pounder are two good standards for a secondary armament, although the former is perhaps a shade too large for the best size in a quick-firer, and, were it not for certain facts mentioned hereafter, a Q.F.

gun, throwing an 80-lb. projectile, would be suggested for general service in battle-ships and cruisers of all sizes in the British Navy. A wire-built 80-pounder, 40 calibres long, with a muzzle velocity of about 2,200 feet, could be designed to weigh not more than $4\frac{1}{2}$ tons, and should have a penetration of about 12 inches of wrought-iron. Considering the fact that the quick-firers of a battle-ship are, for the reasons already put forward, a minor part of her armament, only useful against cruisers or the unarmoured parts of another battle-ship, it is here contended that, under present conditions, the 6-inch 7-ton 100-pounder gun is unnecessarily heavy and powerful for this object, and that a battery of twenty 80-pounders would answer the purpose better than one of twelve such. The total weights ought to be approximately equal, and in practice the diminution in the size of projectile would probably increase the rapidity of sustained fire, enabling the former, with its eight extra guns, to throw just about double the number of shells in a given period than the latter could; while nothing but the thickest armoured parts of a ship could resist the attack of the lighter gun, any more than that of the heavier one. This is a great consideration; for, putting aside the fact that by doubling the number of rounds the number of actual hits ought also to be doubled—and a hit of any sort is always something—there can be no doubt that two 80-pounder shells would do more damage, as a rule, than one 100-pounder, which also might be over a much more widely diffused area. Fired at a ship with a casemated battery, one of the latter could scarcely by any chance put more than one gun out of action, but two guns might easily be disabled by two of the former. Fired at a ship with an open battery, and exploding inside, either sized shell would knock over every man at the guns; and when two rounds take the place of one, there is, of course, as previously remarked, just double the chance of bringing this off.

There are, however, strong arguments against such a change, and the 6-inch gun will be adhered to, in the proposals of this essay, as the best for the secondary batteries of our future ships. These arguments are as follows:—

Firstly, that this gun is so widely established and distributed through the Service that it must remain, and further developments in designs ought to proceed along the same lines, with a 6-inch calibre as an invariable basis.

The introduction of a new gun would involve the far greater evil of adding yet another variety of ammunition to the present list. The other two arguments are based on two suppositions of a diametrically opposite character, which cannot both prove correct, but one of which must. Either armour will be increased in resisting power in the future proportionately to its thickness, or it will not. If not, then the penetrating powers of this 80-pounder would prove sufficient for all demands likely to be made on them; *but* the adequate casemated shelter which every individual gun should be afforded would, by the addition of the eight extra guns necessitate an undesirable increase in the weight to be carried. This difficulty might be met by either an increase in the size of the ship,

a reduction in the thickness of the armour elsewhere, or a reduction in the amount of ammunition and coal stowed, but all these alternatives are open to objections.

There seems no reason to be certain, however, that the resisting qualities of plates will not go on increasing, as improvements in their manufacture are worked out or discovered, and, if so, the extra casemates being thinner, could be carried easily enough ; but, on the other hand, it will become necessary to arm ships with more and more powerful guns to obtain perforation. It seems, indeed, to the writer as quite conceivable that the day may not be far distant when we shall see ships completely encased with a shell of steel thin enough to be carried, yet thick enough to be proof against anything but heavy ordnance, and the original idea of an entirely armoured ship, which was the starting point forty years ago, almost returned to, the only difference being a question of degree. If that does come to pass, we shall have to work through the same cycle of respective advances in penetration and resistance all over again, but on a higher plane, and a gun of seven tons already in the Service will have more future value than one of four and a half, presuming that the designs are equally good.

The question of the pattern and size best adapted for the smallest guns in a battle-ship is rather a difficult one. In theory the more she can carry the better, obviously enough, and, once again, on the principle of homogeneity consistently extended, it would be a great thing to have a weapon universally suitable to all the units of a fleet, battle-ship, cruiser, and torpedo craft, if such could be devised. A disabled battle-ship might in that case prove a veritable mine of wealth in the way of ammunition to a flotilla of destroyers returning with exhausted magazines from chasing torpedo-boats, whose services were again urgently needed, say at nightfall ; which, if an exceptional, does not seem a remotely improbable contingency. The 6-pounder would answer the purpose well enough, were it not for the fact face-hardening procesess have so increased the resisting power of steel, that almost any protection will foil the attack of such a gun now, and a heavier one is needful.

Moreover, although in theory the extreme multiplicatcn of guns is sound, in practice it leads to a most undesirable complication of the difficulties of supplying ammunition, and supervising the firing. For these reasons the 12-pounder gun is taken here, as approximately the best for third and last type of a battle-ship's armament.

It is not proposed in this essay to advocate fighting tops, or heavy masts of any sort. This is perhaps a somewhat radical position to take up, but it rests directly as does the suggested thinning of water-line armour—on the overwhelming logic of practical facts exemplified in the wars whose study is laid down as conditional to the essay. Out of a total of seven masts carried in Cervera's squadron, five came down completely, and both the others were apparently perforated and damaged. At Yalu, all the fighting tops were disabled and silenced on the Chinese side. In both engagements also, the funnels were repeatedly struck, and it seems evident that, up to a certain point, the higher an object stands above the

water the more likely this is to happen. This no doubt is easily accounted for, and arises mainly from errors in the range, which are pretty sure to be the commonest of all errors in action. A gun when oversighted naturally throws over the object aimed at, and, on the other hand, a projectile falling short in most cases ultimately does the same, for it nearly always flies high on the ricochet, as may be seen any day at target practice.

The net result is that a very large percentage of all the bad shots go over the enemy, which is almost assuredly equivalent to saying that this is the case with a large majority of the projectiles fired. It might, therefore, have been predicted with tolerable certainty that high objects such as masts, funnels, etc., would suffer, and experience now shows this to be the case. The small number of light guns carried in fighting tops form an insignificant addition to the power of a battle-ship, and the fall of a heavy steel mast, might entail very grave consequences, especially if it lay over a barbette.

It is here contended, therefore, that while light masts are quite necessary for signalling purposes, their uses should be restricted to that object. For hoisting in heavy boats, the French system of hinged "gallows" is very well adapted to a man-of-war, and either those or cranes such as are carried by the "Vulcan" are considered preferable to steel masts and derricks. Both stand lower, and both if shot away would fall outboard, clear of the main armament, at all events. Moreover, if the boats were left behind, as appears likely to be the case, these could also be removed before sending a ship away to war.

In the matter of machine guns, it appears probable that naval actions will be fought at ranges beyond the really effective use of rifle calibre or even rather larger weapons. At Alexandria the 1-inch Nordenfeldts did absolutely nothing; but a 1-pounder Maxim is said to have been designed, and with the improved carrying power obtained by the introduction of cordite might prove of some use if played on sighting hoods or apertures, turret ports, etc.; or might even very considerably affect parties working on deck to clear away wreckage or suppress outbreaks of fire. As a defence, moreover, against torpedo-boats or destroyers, such guns, in the writer's opinion, would be far superior to anything at present known, and half-a-dozen or more might be mounted in every ship with great advantage, mainly with that object.

The small arms of a ship do not exactly affect her type, but they are part of her fighting equipment, and may be referred to incidentally. In the ideal battle-ship which the writer is supposed to suggest, there would be a rifle for every man, but cold steel weapons would have no place, with the exception of the bayonets carried by these rifles. In Egypt and the Soudan, the field and machine guns crews all carried rifles, and found much use for them. It is admitted that boarding pikes would have their uses in some directions, but in the hands of domestics and cooks it seems doubtful whether they constitute a formidable addition to the defences of the Empire.

g. Ram and Torpedo Power.—The use of the ram and torpedo in fleet actions has been somewhat discredited by the light of events in the two recent wars; for except in one doubtfully ascertained case towards the close of the battle of Yalu, in which it has been stated rather vaguely that one counteracted the other, there was not a single occasion in which they were brought into use, whether this was intentional or accidental. There seems no reason to doubt, however, that it was the former, and the reasons are not far to seek.

It has been said by the advocates of these weapons, that they at all events modify the tactics of two fleets; that may very likely be so; but that they do not modify them to such an extent as to materially affect the result, is very evident from the complete nature of the victories gained at Yalu, Manila, and Santiago without recourse to their use.

It is also often stated that they are the weapons which should be used by the weaker or losing side, but that can only be effected when most culpable carelessness is displayed by the stronger or winning. If for instance, Cervera had attempted such manœuvres as a last resort, the American ships would merely have required to alter course as necessary, and keep the Spanish under a raking gun fire, to settle the affair as decisively as ever; for the latter did not possess such a superiority in speed as to enable them to cover the distance between the fleets in the short time requisite to prevent the Q.F. batteries from doing their work.

When used by a battle-ship, there is a similarity on general lines between the natures of these two weapons. Both endeavour to act against the enemy through a ship's most vulnerable parts, namely, below the water-line, and both in consequence if successful must almost inevitably obtain results of a most decisive nature. Both also require very close range attack, both are entirely dependent on the handling of a ship or perhaps even more on pure luck, and both are at all times very uncertain and unreliable. Consequently both have been placed under one heading as requisite features in the powers of a battle-ship. Beyond this, however, their similarity ends; and, as there exist points of difference in other ways, they will be treated separately and in detail; beginning with the torpedo, which, if either are resorted to, is considered the one most likely to be used.

To begin with the placing of torpedoes, it seems quite certain, from the accident to the "Oquendo," that all tubes should be submerged; for otherwise with torpedoes in them they are a source of imminent danger to the ship carrying them. Bow tubes above water are especially dangerous, for a ship in the "end on" position requisite for using such would have all her opponent's fire concentrated on that very part. Under water in the stem, they interfere with fine entry and speed, to say nothing of a ram, and as torpedoes are especially unreliable in their movements when fired ahead from a ship with way on, it is considered that in battle-ships they should be done away with in that position altogether.

On the broadside however they have no such drawbacks, and a pair of submerged tubes on each side should be carried. Placed so, they would be principally of service in deterring an enemy from ramming even

a disabled ship, and in fact it has been stated, rightly or wrongly, that this did actually occur in the disordered formations of the fleets at Yalu, when a Chinese cruiser was sunk in attempting to ram an opponent. A ship may be disabled in machinery and guns and still retain this power of defence with its great potentialities, and this alone seems a strong argument for the inclusion of torpedoes in the armament of a battle-ship.

The writer holds to the opinion however, that perhaps a still better position for a submerged tube is astern; because the knowledge that an adversary carried this sting in her tail would have the most pronounced influence of all in preventing attemps to ram; for if the ramming ship missed her stroke, she ought to be herself inevitably sunk. Torpedoes run somewhat erratically from stern tubes, but not to such an extent that they could very well help hitting the target presented by the whole length of a ship only a few yards off. She might of course try the effects of a shot from one of her own broadside tubes in return, but her chances of success would be very poor, as the target would be small, and the torpedo almost certainly deflected by the back-wash off her opponent's propellers.

The ram as a weapon has of late years been in very great favour in theory, but practically it has only achieved one prominent success in battle, and that was at Lissa, which took place before the era of Whitehead torpedoes. The fearful results however, arising from its accidental use led a strong section of popular and professional opinion to jump to conclusions as to its value, without considering the antecedent conditions of the cases. Neither the "Vanguard," "Grosser Kurfürst," nor "Victoria" were making any attempts to evade it, until the last few moments; and it seems safe to assert that none of them would ever have allowed the ships by which they were sunk to approach so very closely had they been enemies in action, or, if they had, would have first inflicted decisive injury with their own armaments.

Ramming is at best beset with difficulties: a desperate business, which should only be resorted to when all else has failed, and desperate measures are necessary; and even then it can seldom be anything but a matter of luck. To begin with, a ship must first possess superiority in speed, or turning power, or both. She must next force her way through the whole zone of her enemy's fire, in which, if the enemy is handled with any judgment, she will, as a rule, be kept for a sufficiently long period to decide events by the guns one way or the other. If not, however, she next comes within range of his torpedoes, and in nine cases out of ten within their bearing. Supposing, again, these miss, and she still survives so far, then the greatest of her difficulties, and the greatest of her dangers, appear at the end; the first of these lying in her final movements immediately preceding actual contact, and the second in her position should the attempt fail. It is often said that there is only half a ship's length between ramming and being rammed, and when two ships are moving at fast, but probably at more or less unequal, speeds, and on constantly varying courses, the accuracy of judgment and eye necessary to make contact at the right moment and place a matter of *certainty* is scarely possessed by any human being. But failure to ram ought almost

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always to bring fatal consequences in its train to the ship attempting it if the enemy herself has a ram forward, and a submerged torpedo-tube ready for action aft; for if the effort is really a determined one, it will be too late to sheer up on the enemy's beam when it is seen the stroke is going to fail, and the ship must consequently pass on either across the former's bows or under her stern. In the first case, she would herself suffer the fate that she proposed inflicting, and, in the second, she would be blown up. Finally, escaping all these dangers, supposing she actually succeeds in getting the blow home, she will then probably find herself in a disabled or even sinking condition, if we can judge by the experiences of the "König Wilhelm" or "Camperdown." This is justifiable only when her loss or disablement was already a foregone conclusion, as in the predicament of a small ship unable to escape from a larger, or one badly beaten in gunnery from her victorious opponent; and in these special cases the opportunity ought never to arise, as previously stated, if the winning ship is ordinarily careful.

As a ram, however, is not in itself detrimental to ship's speed or general efficiency, the difficulties and dangers attendant on its use need not by any means altogether prohibit its inclusion in the construction of a battle-ship; and there exists besides the argument in its favour arising from the hypothetical case just quoted, or of an enemy misjudging her movements at the critical moment, and getting rammed herself. This presents it in the light of a useful weapon of defence, and one that is at any rate likely to influence the enemy's tactics. It is considered here, in consequence, that it should always form a feature in a battle-ship, although as the least important of her fighting essentials.

Intimately connected with the use of ram and torpedo is the question of a ship's turning and manœuvring power, for it is by the movements of a ship alone that they are brought to bear, and not, as in the case of guns, partly by the independent training of the weapons themselves.

A ship's turning capabilities are dependent on her under-water lines and the area and position of her rudder, assisted occasionally by the use of twin screws. As a rule, the best shapes for manœuvring are not conducive to speed, and, in the efforts to obtain the latter there has been to some extent an unavoidable retrogression in the former from the types of twenty years ago. At that time the ram held a very prominent place in the general estimation, and as the short full shapes which are best adapted to its use also possess good buoyancy, many ships were designed and built on these lines which would be considered very deficient in speed by the standards now accepted. As the great value of speed came to be recognised, these designs gradually gave way to the longer and finer ones of the present day, which, although entailing, as before stated, partial forfeiture of manœuvring power, must, on the whole, be considered a distinct advance when the relative importance of the two is in question.

Having got the speed, however, it is, of course, advisable to get the best turning powers that will go with it. The removal of the "dead-wood," as in some late designs, ought to help towards this. The drawback to it is, that it seems to throw constructional difficulties in the way of

fitting balanced rudders in large ships, from the consequent want of a lower support, although this is not the case with small ones. If, however, this could be overcome, it would be very desirable, for the advantages of a balanced, or partially-balanced rudder, especially in case of manipulation, are incontestable.

To summarise the ideas, then, of this essay, as to the points which, when combined in the whole, would produce the best type of battle-ship for the British Service, she should first possess sea-going qualities of the highest order. Her armament should comprise four 12-inch wire guns of the latest mark, disposed in pairs *en barbette*, either on the mountings and mechanism which obtain in our latest ships, or electrically controlled; at least fourteen 6-inch quick-firers; twenty 12-pounder quick-firers; and six or eight 1-pounder Maxims. The protection would consist of 12-inch plating for the barbettes, 8-inch on the sides of the citadel and front part of the casemates of all the 6-inch guns, 4 or 5 inches right round the water-line, thickened to 10 just abreast the engines, and 10-inch on the conning towers, with 10-inch hoods for the barbette guns. She would also carry a 2- or 3-inch steel deck fore and aft, thickened to 4 or 5 inches below the slope of the turtle-back, and a 1-inch steel deck over the central space between the barbettes. Her speed would be eighteen knots, and she would be propelled by twin screws, the steam being generated in water-tube boilers. Her total coal stowage would amount to two thousand tons. She would carry five submerged tubes—two on each broadside, one aft—and a ram. She would have no heavy masts or fighting tops, and all fittings of every description not absolutely required, and likely to increase the effect of an enemy's shell fire, would be reduced to a minimum, and made easily removable at short notice if necessary, the boat-hoisting arrangements provided being either cranes or "gallows." The ship herself would require to be large enough to carry her weights on a total displacement of about fifteen thousand tons, and would in general structural design resemble H.M.S. "Formidable." As matters of miscellaneous detail, she would have a balanced rudder, if possible, and no "deadwood"; her fire-extinguishing arrangements would lie entirely below the steel protective deck, with the exception of the uptakes and deliveries; and no permanent woodwork of any sort, whether on decks or elsewhere, would be worked into her. Such a ship, well officered and manned—on which point we can leave our minds at rest—would, in the writer's opinion, prove perfectly adequate in all ways for the accomplishment of any task which fell to her lot, if called upon to take her place in a British fleet engaged on active service against any possible opponents.

PART II.—First-class Cruisers.

"In the designing of a cruiser, as of any class of war-ship, the first step, before which none should be taken, is to decide the primary object to be realised—what is this ship meant to do? To this primary requirement every other feature should be subordinated." So writes Captain Mahan in the article in the *Times*, which has already

been quoted more than once, and although some of his contentions in other articles of this series have been much disputed, it seems scarcely likely that this one will fail to find a universal acceptance.

It is, therefore, a much more difficult and complex affair to form definite or pronounced opinions as to the best type of cruiser than to decide as to the best type of battle-ship, as the duties of the former are much the more varied of the two. A battle-ship proper is built with a single purpose in view, that is to say, the construction of a vessel whose whole business is to fight for the command of the sea against all comers, no matter how powerful, and the purely superlative in fighting qualities should therefore be aimed at throughout. A cruiser, however, is primarily a scout, or, at any rate, that is the view the writer takes; and, secondly, a guardian of commerce and lines of communication. Her first distinctive characteristic must consequently, in any case, be the possession of high speed, and a cruiser without speed is about as useful as a cart without wheels. But for the effective performance of the latter of her duties at least, she must also possess more or less fighting strength, for the mere definition of a "guardian" implies the attribute of power in some sort of degree.

It is mainly on this point that any decision as to the best type of cruiser is so open to controversy. A battle-ship cannot be too strong; a cruiser can, if it should be proved that her strength is detrimental to her speed, or an amount of money has been expended on obtaining that strength which could have been laid out better in building instead two or more ships with less fighting power, but better adaptations as cruisers otherwise. Writing of cruisers in the article quoted above, Captain Mahan remarks that "rapidity of action is their primary object. Defensive strength . . . does not conduce to rapidity of movement, nor does offensive power; they must therefore be very strictly subordinated. They must not detract from speed; yet so far as they do not injure that, they should be developed, for by the power to repel an enemy—to avert detention—they minister to rapidity."

If then a cruiser ought not to be unnecessarily powerful, the question is, how much strength does she really require? and as a result of the great divergence of opinion on this point, modern cruisers range in dimensions from 2,000 to 14,000 tons, with every intermediate size possible; and are armed with a heterogeneous assortment of weapons varying in weight from one to thirty odd tons, and in numbers to almost the same extent in different individual ships. Some cruisers are, indeed, almost battle-ships; others not much more than large torpedo-boats, or lightly armed merchant-steamers.

With such a variety as this, difficulties arise in selecting any particular existing type as an ideal, and it is therefore proposed instead to examine the sphere of action in which our cruisers may be expected to find their proper place, and endeavour to work with that starting point alone, assisted by the experience of the recent wars; which, as regards cruisers, exhibit some valuable lessons.

To qualify for their first line of duty, then, as scouts for a fleet, it seems reasonable to assume that they do not require to possess much except high and easily sustained speed, with at least fair coal stowage; and even small or lightly armed ships will answer the purpose very well if they have these. Torpedo-gunboats have frequently, during manœuvres, been allotted to the same duties as first-class cruisers, and have sometimes performed them even better by reason of their very smallness, which to some extent enabled them to escape the enemy's notice. In 1896 a detached scouting squadron of two cruisers and two gun-boats belonging to C fleet, were surprised off Land's End by the "enemy" in force, and obliged to run. One of the gun-boats by hugging the shore under the cliffs and covering her funnels and white paintwork with wet canvas, eluded observation altogether; and by doubling back managed to join her own main fleet before daylight, long before either of the two cruisers, on whom the enemy's attention and chase had been concentrated from their very size. As it happened, the admiral had already received news of the enemy's movements from the coastguard; but it might very well have been otherwise, in which case this small craft would have been the first to bring it by many hours; and this particular instance is by no means a singular one of that sort of thing.

The chief drawback to a small ship in such work lies in the difficulty of transmitting distant signals, and, even more, of receiving them, for in a seaway their movements are so lively that it is quite impossible to keep a glass fixed on any object, although the introduction of truck semaphores has considerably obviated this defect. In larger ships it disappears altogether, and there can apparently be no question that big ocean-going liners, of commanding speed, may prove extremely useful as scouts.

This point was strongly remarked by the late Admiral Hornby when referring to the performances of the "Oregon" in his report on the 1885 manœuvres, and we have the instance of the use of vessels of this class by the Americans, in their recent war. It is true that Cervera evaded their search, but that was in no way due to the ships themselves, and would have occurred none the less had they been powerful first-class cruisers instead of lightly armed mail-boats.

We are sometimes told that a scouting ship should be capable not only of getting information herself, but of preventing the enemy's scouts from getting it, and ought therefore always to possess at least fair fighting power. There may be something in this, but not, in the writer's opinion, enough to warrant the outlay of heavy sums in building powerful cruisers, had they not other duties to perform. In the first place, if we adhere to our true policy of taking the offensive, it will rest with our fleet to find the enemy at all times, and, if the enemy are equally anxious to engage, neither side will have any object in eluding observation. If, however, they are desirous of avoiding fleet action, it will be they who wish to prevent the acquisition of intelligence as to their movements, not we. Secondly, the fact should be borne in mind that for the total cost of one first-class cruiser, ten good torpedo-gunboats, or five good third-class cruisers, can be turned out, all of equally high speed; and if the ten

gun-boats, or even the five smaller cruisers were to set to work to find out what was going on, the single big ship could certainly not prevent it. She might chase or drive off one or two, but while her attention was so fixed, the rest, provided they had sea room, would only have to disperse, to slip past her out of range in any direction they pleased.

If, therefore, cruisers only existed to provide eyes and ears to the battle-ship squadrons, the types suggested in this essay as being in the main the best adapted for the purpose would be small ones, though with a proportion of large but lightly armed craft in addition. As previously remarked, however, cruisers have other duties besides this; for on them must chiefly fall the task of protecting commerce in general, and the lines of communication over which the supplies for the fleets travel during war.

For this branch of their work, the three principal necessities of a scout—that is to say, perfect seaworthiness, high speed, and large coal stowage—are also necessary, forming a good foundation on which to make a start, but not in themselves sufficient. To protect the commerce entrusted to their care they must be able to meet on at least equal terms the opponents endeavouring to destroy it. Here, then, we have something more or less definite to go upon, and the distinguishing features of foreign cruisers should directly influence and control the types we build ourselves, for the mere existence of these possible enemies imposes upon us the necessity of producing ships to match them.

Keeping this always in mind, therefore, the writer proposes now to consider the characteristics which should predominate in the vessels designed to serve as British cruisers of all classes.

A first-class cruiser in the British Navy ought to be a match for any first-class cruiser in the world, for it may fall to her lot to be sent in chase of such a ship, should the latter be despatched on a commerce-destroying expedition. To attain this ideal, the writer holds to the opinion that her requisites stand in the following order:—

a. Seaworthiness.
b. Speed.
c. Coal stowage.
d. Medium calibre gun power.
e. Protection.
f. Ram and torpedo power.

a. Seaworthiness.—It might almost be said that seaworthiness is of greater importance to a British cruiser than to a British battle-ship were it not the most important necessity in both, for although either must be prepared to keep the sea in all weathers, the latter is less likely to find herself compelled to fight in a gale than the former. Foreign battle-ships are rarely such good sea boats as our own, some of them—such as the American "Indiana"—being unable even to work their guns if it is blowing really hard, and it would consequently be a most improbable circumstance to find them at sea at all under these conditions if they could possibly help it. Foreign cruisers, on the contrary, are often remarkably fine sea boats, and, as very stormy weather will always drive blockading torpedo-boats and torpedo-boat destroyers to shelter, it is just at these

periods that we may expect to find commerce-destroyers endeavouring to slip out of blockaded ports. The seaworthiness of our own cruisers ought, therefore, to be of such a nature that they can not only remain at sea, but fight at sea at all times, carrying their battery, or part of it at any rate, high above the water, and possessing sufficient freeboard forward to stand driving against a sea without losing too much speed, or preventing the use of their forecastle guns while in chase.

A ship of this sort might even make things very awkward for a low freeboard or coast-defence battle-ship, if she happened to catch her outside, in a heavy gale. Fortunately most of our cruisers are uncommonly fine sea boats, and the high forecastle universally adopted in the later types gives them excellent chasing qualities.

To get really formidable offensive powers, however, with fair protection and high speed under such conditions, it is necessary to build at least a 13,000-ton ship.

b. Speed.—Captain Mahan, in his article already twice quoted, says that "rapidity of action is a cruiser's primary object," and if great seaworthiness has been placed before high speed here, it is only because the latter cannot be attained in sea-going ships until the former has been first secured.

High speed is obviously a matter of vital importance to a cruiser in whatever branch of her work she may be employed. If scouting she must be fast enough to escape capture by the enemy, while at the same time, to be of any use, keeping closely in touch with him; and must, therewith, be capable of carrying important intelligence with a minimum of delay. If, on the other hand, she is employed in the defence of commerce, she can only hope to fulfil her task by having the power of catching up the enemy's speediest ships that are attacking it, and bringing them to action.

Bearing this in mind, then, it is here maintained that as several foreign cruisers are now afloat which can travel at twenty-three knots, or even slightly more under favourable conditions, a first-class cruiser to attain to the standard required of her in our Navy should be able to steam at a reliable twenty-four. To get this commanding speed a vessel must be built on fine lines; and it is chiefly because fine lines cannot be combined with great buoyancy or carrying power, as previously remarked, that cruisers are unable to carry the great weights necessary for a battle-ship, even when of a size which is approximately the same.

As regards the propelling agency when such speeds are aimed at, it is the writer's belief that triple screws may after all prove an advantage, although admitting there cannot be said to exist as yet sufficient experience to warrant a pronounced opinion to that effect. They are at present in what may be considered an experimental stage in some foreign Navies; and, although they present objectionable characteristics in a multiplication of the machinery, and a complication of structural features in the hull, there is this much to be said in their favour, that they must reduce the chances of total or partial disablement or loss of speed, and also greatly facilitate a sudden increase of speed if a ship is called upon to make it. A

ship moving at a leisurely rate, using the central propeller, and keeping a reserve of steam for the others, would probably cruise more economically than a twin-screw ship, and have the power to put on a spurt at almost a moment's notice. Some cruisers are fitted with two sets of engines to each shaft, one set being capable of disconnection with these objects in view; but this plan can hardly be pronounced as a success. A noticeable example of one of its drawbacks is afforded by the case of the U.S. steam-ship "Brooklyn"; when Cervera's squadron suddenly appeared coming out of Santiago Bay at top speed, the "Brooklyn" was cruising with her forward engines uncoupled. There was no time then, however, to spare for connecting up, and she was forced to do the best she could without. As it proved, the Spaniards were unable to get more than fourteen knots out of any of their ships, and the "Brooklyn" was not therefore out of the chase after all; but if her enemies had been able to work up to their "paper" speeds, she most undoubtedly would have been with half her motive power lying idle all the time.

The points in favour of water-tube boilers have already been remarked in a previous section of this essay, and need not be repeated. In the views of the writer they are just as suitable to a cruiser as a battle-ship.

There is one more matter of detail directly affecting the question of speed, especially in ships with fine lines, and that is, the desirability or otherwise of sheathing and coppering. A sheathed ship is very slightly heavier and coarser in her lines than an unsheathed one, and consequently, when both are clean, very slightly slower. After a brief spell out of dock this inferiority usually disappears, and in the process of time as the unsheathed ship begins to foul, the relative superiority becomes inverted in favour of the sheathed. As the work required of our big cruisers may, and indeed often does, take them on long trips, without opportunities for docking, the sheathing must on the whole therefore be taken as an advantage, and is considered here as desirable in such vessels.

c. Coal Stowage.—For a cruiser the question of coal stowage is even more important than for a battle-ship. A small capacity would detract most seriously from her efficiency as a guardian of commerce by preventing her from being able to cover at good speeds the long distances she may be required to make between ports in chase of hostile ships. Frequent coalings mean frequent delays, and militate against the rapidity of action, which is a cruiser's essential property. Most of the large vessels of this class, which have been built abroad for the special purpose of attacking commerce, carry enough coal to steam a distance of ten to twelve thousand miles at their economical speeds, some even rather further. A British cruiser in chase would in general work with the advantage of a much larger choice of coaling bases, of course, as we possess them in or near all the more important lines of traffic, and foreign countries do not; but frequent stoppages might be fatal to successful pursuit. If foreign cruisers can steam for twelve thousand miles, then our own cruisers should be able to do the same, and a thirteen-thousand-

ton ship would require for the purpose a bunker capacity of not less than two thousand five hundred tons, probably more.

It has been remarked by Captain Mahan, in the article already so repeatedly quoted, that a minute sub-division of a cruiser's bunkers, with the idea of reducing her chances of being sunk in action, is, after all, most undesirable; and he instances the "Minneapolis" as an example. The time lost in coaling and trimming coal in that vessel proved a serious drawback to her efficiency in doing her proper cruiser work. As he points out, this is a case in which a cruiser has been given excessive defensive power, which detracts from her rapidity of action. It is held in this article therefore, that our cruiser's bunkers should be placed and designed as simply as possible to avoid this serious defect.

d. Medium Calibre Gun Power.—A cruiser cannot carry the heavy armament of a battle-ship, and in consequence ought never to attempt to engage one if she can avoid it. She must, however, have sufficient powers of offence to be a match for ships of her own class, so long as these powers do not act detrimentally to her good. The question arises therefore as to what is the best kind of armament for the purpose, and the answer seems fairly plain. Her enemy is, even if to some extent armoured, usually a weak target which can be destroyed by light gun-fire. Six-inch guns are quite large enough for the purpose, and as a matter of course, the more that can be brought to bear upon her the sooner will the object be accomplished. Heavier weapons, such as 8- or 9-inch guns are unnecessarily powerful, but at the same time not powerful enough to enable her ever to face a battle-ship, and they are much slower in their action than lighter ones, which is a serious drawback. Remembering this, therefore, and also the fact that two 6-inch guns can be carried for one 8-inch, or three for one 9·2-inch, the writer contends in favour of the lighter weapons throughout, supplemented by 12-pounders; and advocates a battery of eighteen or more 6-inch, and at least a dozen 12-pounders, as the best for a first-class cruiser. Of the 6-inch, two would be carried in small turrets high on the forecastle, at least thirty feet above the water; for a cruiser should possess good chasing qualities in all weathers. Two more would be on the quarter-deck, also in turrets; and the remainder on the broadside, as high and well separated as possible, the upper tier at least twenty-five feet above water. The 12-pounders would be carried, if possible, immediately above the casemates of the lower deck 6-inch, so as to get the benefit of the casemating as a protection for their ammunition supply, and a 12-pounder gun might, with advantage, be placed on top of each of the small 6-inch gun turrets on the forecastle and quarterdeck.

More or heavier guns than this could no doubt be carried, but it is as great a mistake to over-arm a cruiser as a battle-ship. The "Reina Regente" was lost to Spain some years before the war, apparently for no other reason than that she was so much overweighted in this way that she could not weather an ordinary gale. The excessive and mixed armaments put on board many cruisers, built by private firms in our country for foreign Navies, are to be deprecated on this account, and also because it is at least

doubtful as to whether the scantlings of the ships are really stout enough for them. They may come successfully out of such things as contractors trials, etc, but whether they will be equal to the much more severe and prolonged trials of war is quite another matter. Both the American vessels "Iowa" and "Texas" were considered successes after they were built, but we find in the appendix to the official report of the U.S. Bureau of Navigation on the war remarks such as these:—"The 'Iowa's' 12-inch guns both forward and aft injured the structure of the vessel, and her deck beams were deflected to such an extent that the trolleys which supported the lower torpedo-tubes became useless," and again in the "Texas" the rivets of the steel deck were sheared, allowing the deck itself to be separated from the supporting beams, the blast of the 12-inch guns was responsible for the damage, and the chief executive officer reports that the "Texas" was framed too slightly "to permit the further firing of the 12-inch guns over the decks without serious injury." It is true that these are both battle-ships and not cruisers, but their case is quoted merely to emphasise the point that vessels may be accepted as perfect in all respects from the builders' hands and yet fail under stress of actual war.

e. Protection.—The right amount of protection to supply to a cruiser is a very open question. Captain Mahan's axiom that defensive powers must be subordinated to speed is not always followed in foreign countries; and that being the case, we have no option but to handicap the speed of some of our ships also, by making them carry armour in order that they may have the power to meet possible enemies on equal terms.

As against a battle-ship, a cruiser's speed must be her principal, if not almost her only, safety. She ought, however, to be strong enough to stand her chance with any vessel of her own class, and, in fact, she must be so if she is to be of any use in stopping depredations on commerce. The question of the best disposition of the light plating she must to some extent carry becomes then a matter of great importance, in order that she may not be hampered with any valueless weight; and the theory already advanced in this essay, that, in the present era of quick-firers and high explosives, it has become a more urgent matter to protect guns and men than water-lines, applies equally to cruisers, if it applies at all. It is by the example of cruisers that the lesson is presented, and although Cervera's squadron did actually surrender to battle-ships, this was not due to the battle-ships' heavy weapons—their distinctive feature as battle-ships—but to their light, or, in other words, to the same agency which would be used by another cruiser. It was almost entirely by the fire of 6-inch or smaller guns—with the exception of some 8-inch hits—that the Spanish ships were so badly smashed up and their crews so utterly demoralised, that they were very soon run ashore hopelessly defeated, although with water-lines and machinery practically intact, save for a few 6-pounder scratches here and there.

In the type of ship we are now discussing, consequently, the whole of the 6-inch armament should be carried in separate casemates, with front plating of not less than 6-inch Harveyized or other hardened steel, and side and rear plating of about four. Every casemate would have

a 5-inch ammunition supply trunk, carried right below the water-line. The forecastle and quarter-deck guns would each be covered completely by a small turret or circular shield, worked by hand, with similar thicknesses of armour in front and rear. It is very noticeable from the reports on the conditions of the Spanish cruisers, that the rear, as well as the front, of a gun should be to some extent sheltered, for shells often explode well inside a ship. It is also worthy of remark that an insufficiently thick shield is worse than none at all, as it may cause the explosion of a shell that would otherwise have passed clear altogether, while being incapable of affording adequate protection from its effects. This was proved in both wars, and attention was specially drawn to it in the American official report by referring to an occurrence of this nature on board the "Oquendo."

The same report remarks that the protective decks did their work well in all the lost ships. This is for us one of the most satisfactory comments on the whole war, as these decks originated with English designers, and are an almost universal feature in our cruisers; and with the definite knowledge that is thus acquired as to their great efficacy, it apparently becomes a question whether a belt is really of any use to a cruiser at all. A protective deck performs double functions, for it not only shelters the vitals of the ship from the direct horizontal impact of an entering projectile, but also from the incessant explosions of shells which are taking place above them during an engagement, and these latter form almost certainly the greater danger of the two. A belt, on the other hand, only provides against the first, and, as frequently remarked already, the risk of serious damage by this means appears to be decidedly remote.

A few very light shells, however, did strike Cervera's ships in the region of the water-line, although nothing that a 4-inch plate would not have resisted; and, as admitted in dealing with the protective features of battle-ships, these might cause trouble, if not danger, should they succeed in entering. A 4-inch belt, therefore, would be supplied to the cruiser suggested by this essay, reduced gradually to 2 at the extremities of the ship; and this, in conjuction with a complete "turtle back" protective deck, varying from 2 to 4 inches in thickness with the angle of its slopes, would complete her protective arrangements, with the exception of her conning tower and a 3-inch shell proof trunk round the 'tween-deck funnel casings. The combined weight of case-mates, trunks, turrets, and belt would, when the reduction in the thickness of the belt is considered, be less than the weight already carried by many cruisers provided with heavy belts.

In a cruiser the removal before action of all fittings likely to increase the destructive effects of shell fire is, in the writer's opinion, an even more important step than in a battle-ship, because the crew are, on the whole, less protected. All the arguments advanced in support of this when dealing with the subject in connection with battle-ships hold equally, therefore, if not more, in the case of cruisers; and there is one more to be added, if the cruiser is built after the particular type here suggested. The removal of armour from the water-line to the gun

positions means the heightening of a certain amount of the weight carried, and it consequently has the one drawback of reducing the stability of a ship to some extent. It may be doubted if the reduction would be sufficient to endanger her, but in any case a ship can scarcely have too much stability, and the absence of all unnecessary top hamper, of course, greatly helps to obtain it. For those various reasons, then, it seems probable that a great mistake would be committed by encumbering such a ship with heavy steel masts, derricks, fighting tops, and an elaborate profusion of upper-deck superstructures.

f. Ram and Torpedo Power.—The subjects of a cruiser's manœuvring, ramming, and torpedoing powers have been here included, in the same way as a battle-ship's under one heading, because the two latter are mainly dependent on the former.

The writer is unable to add much to what has already been said on this topic, when it came under treatment in connection with battle-ships; but a cruiser may perhaps have somewhat greater needs for the power conferred by the possession of these weapons, in order that she may be able to resort to them as a last appeal, in the case of finding escape from a battle-ship impossible by any other means. Even then her chances are poor, for the length of a thirteen-thousand-ton cruiser of twenty-four knots must entail a large turning circle, and therefore detract very considerably from her manœuvring capabilities. There is, no doubt, a bare chance, that by a pronounced superiority of speed, she might force herself close enough to a battle-ship to use a broadside tube; or in theory to ram her by sheer persistency in following in her wake and running her down. But to render either of these cases possible, the gunnery of the battle-ship would have to be of the faultiest description; and if a cruiser had such a very commanding advantage in speed, it is difficult to conceive how she would find herself within range of the battle-ship guns at all; unless in a fatuous endeavour to force her way out of a narrow blockaded harbour in broad daylight, as Cervera did.

Cervera, however, did not have a superiority in speed, as it proved, and, moreover, played exactly into his enemy's hands, by concentrating his squadron, instead of dispersing it. His fate, therefore, does not prove that it would be impossible for a very fast cruiser to escape in even that case, by trusting to her heels entirely, if the blockaders were far enough off at the start, or lost time in getting after her, and she would probably be better advised in following this line of action than in making attempts to ram them, if they had even passably good "men behind the guns," and were properly handled. Supposing, as a case, she was faster than they were by as much as ten knots, and a battle-ship was two miles distant to begin with. To cover this distance and ram, the cruiser would require about twelve minutes, if the battle-ship steamed off at once, and commenced what might be called "an offensive retreat," paradoxical though it may sound. An "end-on" pursuing vessel, however, is the easiest of all things to hit, and in twelve minutes, at short and easily ascertained ranges, she would almost certainly have had enough. This is, besides, an extreme case, as few battle-ships now are so decidedly inferior to cruisers

in speed as all that, and, moreover, with the least advantage in turning power on their side, could prolong the twelve minutes indefinitely if it proved necessary. Nevertheless, as a ram and submerged tubes do not detract from a cruiser's speed, and as the chances of using them seem, even if remote, at least always a possibility, it is considered here that a cruiser should be provided with them on the same plans as a battle-ship. It is true that the French have discarded rams altogether in some of their new cruisers, but that is probably more for the sake of disguise than anything else, for the purpose in view in building these ships is transparently obvious. This, therefore, in the writer's opinion, does not constitute an argument against them.

A type of vessel, then, which would embody the writer's views as one well suited to perform the duties of a first-class cruiser in our Service, would be a large, highly seaworthy ship with a speed of twenty-three or twenty-four knots; an armament of eighteen 6-inch quick-firers, supplemented by 12-pounder quick-firers and 1-pounder Maxims; a coal stowage enabling her to cover twelve thousand miles; armoured casemates for her 6-inch guns, 6 inches thick in front and 4 in rear; a complete protective deck; a water-line belt of not more than 4 inches thickness at its maximum; shell-proof trunks to her funnel casings; three submerged torpedo-tubes, and a ram. A vessel of thirteen thousand tons total displacement ought to carry these weights, but if not, her dimensions would have to be enlarged as necessary.

As regards miscellaneous features in her design, she would present the same general arrangements for stowage of boats, lead of fire mains, and absence of inflammable and splinterable material when possible to do without it, that were supposed to be characteristic of an ideal battle-ship, and she would, moreover, be sheathed and coppered. She would have light pole masts, and no fighting tops. For machinery, she would have water-tube boilers with economisers, and the ordinary type of triple-expansion engines, driving either twin or treble screws, but not double disconnecting sets of engines on each shaft.

PART III.—Second and Third-class Cruisers.

If money were no object, it might be better to build all our cruisers as ships of the first-class type. Money however is always a consideration, and as foreign cruisers vary greatly in size and design, it can best be expended in producing more than one class of ship. For the sum laid out in building such a vessel as the one just dealt with, two second-class and four, or even five, third-class cruisers could be turned out, all capable of meeting the similar classes existing in foreign Services, and, by the numerical increase so obtained, providing a better defence against them. The difference in the types, however, is merely one of degree, for the same purposes must be kept in view in building them, and therefore the same general ideas should underly their designs. The same requisites are called for in the same order of precedence, but on a reduced scale. That being so, it is not proposed to review the qualifications of a good cruiser and the arguments in favour

of these qualifications all over again, and the types of smaller cruisers will be dealt with briefly and generally.

In the writer's judgment a good second-class cruiser should be, like all our other ships, a good sea boat; she ought to have a speed of a least twenty-two knots under moderately favourable conditions, and a coa capacity sufficient to take her eight thousand miles at economical rates. Her armament should comprise about ten 6-inch quick-firers, supplemented by 12-pounders and 1-pounder Maxims. Her protection should lie in a good protective deck, a complete system of isolated shelter for her 6-inch guns, either in the form of casemate or circular shields at least 5 inches thick in front, truncated funnel casings and supply hoists, and a conning tower. She could be fitted with a submerged torpedo-tube on each broadside, another one aft, and a ram. In all other general details and respects she would resemble a first-class cruiser on a smaller scale, and if possible should be a vessel not exceeding six thousand tons displacement.

For a third-class cruiser a vessel of two thousand tons displacement is advocated; a good sea boat with a speed of about twenty-one knots, carrying two 6-inch Q.F guns., mounted one forward and one aft, and a 12-pounder battery of not less than six guns on each broadside. This the writer admits to be a somewhat unusual type of armament, but thinks that its adoption can be justified in the light of recent events. The execution wrought on the unprotected parts of even first-class cruisers by a hail of little 6-pounder shells was a conspicuous lesson of Cervera's defeat. The 12-pounder throws, of course, a shell of just double the weight, and of more than double the destructive power; and, therefore, the writer holds that these guns are sufficiently powerful for the attack of vessels so lightly framed as third-class cruisers or gun-boats; and on account of the much greater number which can be carried, a battery of such seems more suitable for this purpose, and likely to effect its work more quickly than a battery of fewer but heavier guns, such as 4- or 4·7-inch. The 12-pounder is, for its weight, a remarkably handy and hard-hitting weapon, with a very light and simple mounting for the size of the gun. It may be said if that is the case, why include 6-inch guns in the armament of such a ship at all? This has been considered necessary, because it would be possible for even a small sized enemy to carry without loss of speed sufficient protection in a few parts to resist the blows of 12-lb. projectiles, but not those of 100-pounders, and she must therefore always be vulnerable to the latter, even if she attempts to keep out the former. The 6-inch and 12-pounder guns of such a type of small craft would correspond to the 12-inch and 6-inch of a battle-ship on a small scale. It may also be asked, why there should then be the exception to this general analogy which exists in the case of the first and second-class types of cruisers given, in which there is nothing to correspond to the 12-inch guns. The writer's reason for this is, that if foreign cruisers were to begin to carry armour too heavy for the attack of 6-inch projectiles, they could only do so at some sacrifice of speed, and would be overstepping the line which

divides the battle-ship proper from the cruiser proper, by subordinating speed to defensive power—a proceeding which, as formerly remarked, has been pointed out by such an authority as Captain Mahan, to be one that can only arise when the true mission of a cruiser is not kept in view.

This type of third-class cruiser would carry enough coal to steam about two thousand miles, but would not be sheathed, as the limited radius of action of these small vessels prevents them from undertaking very long trips, and the docking facilities are much more numerous for them than for the larger classes. They would, in fact, be mainly restricted to scouting work, and the protection of commerce in places where it is liable to the attacks of small craft.

PART IV.—Torpedo Craft and Destroyers.

In the opinion of the writer, there is no distinct function in war for a vessel smaller than the third-class cruiser, until the class known as torpedo-boat destroyers is descended to, and therefore no necessity for building them. It is true a few gun-boats and so-called "torpedo-cruisers" do exist in foreign Navies, vessels with displacements varying from three hundred to one thousand tons, but they are all so very lightly armed that in many cases a single destroyer of not much more than half their size could meet them on equal terms. Two destroyers could in nine cases out of ten sink or capture any of them. For use against torpedo-boats, the object with which the earlier ones were chiefly built, they are not nearly so efficacious as destroyers; and the same thing may be generally remarked of them when used as torpedo craft themselves, or as scouts, with the one reservation in their favour that their size enables them to stand very bad weather somewhat better, and gives them rather more coal stowage. As commerce-destroyers, they are too small for distant ocean work, and not powerful enough to do much on such lines of traffic as run near their own coasts, even if the shipping on these routes has only destroyers to depend on for defence.

No type of gun-boat or torpedo-gunboat will therefore be described in this essay, and torpedo-boat destroyers will next be dealt with.

In the writer's view, a destroyer should have a displacement of not less than three hundred and fifty tons. A good sea boat can be built of that size with a real speed of thirty knots. The next point to be considered in her case should be her armament, and not, as in the case of cruisers, her coal stowage. The writer arrives at this conclusion by adhering consistently to the principle of keeping in view the object with which a ship is built. A torpedo-boat destroyer is primarily what her name denotes her to be, that is, a vessel existing as an antidote to torpedo-boats. She may of course be appropriated for other purposes, and prove extremely useful in many ways, but the torpedo-boat is her proper quarry. Next to the requisite speed, therefore, she ought to be provided with the armament that will best enable her to realise the object with which she was built. The 12-pounder gun will answer the purpose very well as a rule, but anyone who has witnessed target practice from the gun platform of a destroyer

must have been struck by the great difficulty of making good shooting in a seaway, and it seems quite conceivable to the writer that 1-pounder Maxims might then at all events do better. When there is an uninterrupted stream of bullets issuing from a gun, as in the case of a Maxim, the motion of a ship is at least no disadvantage, possibly the reverse, for "number one" has only to get his direction on—the easiest thing in laying—and then the rapid rise and fall of the muzzle will almost certainly ensure hits, whether the range is correct or not.

For the armament of the three-hundred-and-fifty-ton destroyer then, the writer would choose two 12-pounders, one forward and one aft, on central mountings; and four 1-pounder Maxims mounted on the broadside; the two foremost Maxims well forward, in a corresponding position to the foremost 6-pounders as usually carried in destroyers, so as to have a good fire ahead for chasing.

As regards coal, she should be capable of carrying about eighty tons, when she has a total displacement of three hundred and fifty tons. This would provide her with the means of steaming for about eight or ten days at economical speeds, and about two at full. More cannot well be carried, as weights must at all costs be kept down in such ships, or the very high speeds demanded will be unattainable. For this reason, no real protection of a concrete nature can be supplied either. Her protection against more powerful ships must lie in her speed, and against her own class in having better trained shots at her guns if possible. Neither can she be constructed stoutly enough for any thought of ramming; and except as a means of bringing her guns quickly to bear in various directions when dealing with torpedo-boats good manœuvring powers are of minor importance to her.

The torpedo-boat proper is too small to have many opportunities for executing her mission in our Navy. She is essentially an implement of defensive warfare, because unable to work at any but very short distances from a base, or to remain at sea in even moderately bad weather. She is therefore best suited to the requirements of the weaker maritime Powers, and can be of little use in a Service like our own, whose true field of operations is across the seas on the enemy's coast-line, and whose ships must in consequence, as repeatedly urged, have above all things the power to keep the sea in any weather.

Occasions might present themselves, however, even then, in which a torpedo-boat would have her chance, as, for instance, against a ship endeavouring to break blockade; but as destroyers are invariably supplied with two or more tubes, they should be capable of performing the torpedo-boat's work themselves if called upon in such cases to do so.

They are thus a formidable menace to big ships as well as to torpedo-boats, and should prove most valuable adjuncts to a blockading fleet. The opportunities of using their torpedoes, however, would probably be comparatively rare; and, bearing in mind the now well ascertained risk of carrying unprotected Whiteheads under fire, the writer ventures the opinion that one tube would be sufficient. The saving in weight would enable them to stow a considerably increased allowance of

Maxim ammunition—a very important point when it is remembered that a fleet of fifteen-thousand-ton battle-ships may be relying on their powers to keep off very dangerous assailants.

The recent remarkable performances of the "Turbinia," the little craft propelled by steam turbines, have naturally excited very considerable interest. This type of machinery is still in an experimental stage, and suffers from the great drawback of an excessive expenditure of fuel; but if this can be overcome, its application ought almost certainly to be extended to all classes of small craft, and perhaps ultimately even to large ships, for it has many great advantages over the ordinary type of marine engine. It has not as yet, however, quite established a reputation beyond dispute, and the writer, therefore, does not propose to advocate its use definitely herein, although holding to the opinion that it has shown sufficient promise to merit exhaustive experiment and attention.

PART V.—Miscellaneous Vessels.

In addition to all these various classes of ships, a fleet may be usefully accompanied by a workshop, or repairing-ship, especially if employed away from a base. The American reports all speak highly of the value of the vessel so employed by them, and attached to the Cuban blockading squadron. Such a ship could combine this object with the duty of a torpedo depôt-ship, similar to our own "Vulcan." To be really well fitted for her work, it would be necessary for her to have sufficient speed to remain with the fleet at all times, partly that her services might be available at any moment and partly for her own safety.

Another kind of vessel which as yet can scarcely be said to exist, but which might prove an invaluable adjunct to a fleet in war, is a fast collier or store-ship, specially designed and supplied with all the best appliances for rapid loading and unloading, such as long hatches, travelling cranes, iron tip, buckets, etc. With a sufficient proportion of these vessels attached to his command, to carry reserve stores of coal and ammunition, an admiral could remain independent of a base for comparatively extended periods, and conduct rapid or distant strategical movements with more ease from the increased mobility of his squadron.

Had Dewey possessed a few, his position need never have caused the extreme anxiety to his country which at one time it did.

Such vessels could carry out the ordinary work of cargo steamers in time of peace, under subsidy perhaps from Government, to entitle the requisition of their services when needed.

CONCLUDING REMARKS.

With these remarks, then, this essay will be closed. In dealing with the subject the writer has consistently endeavoured to approach it from the naval officer's standpoint—or at least from what he considers as such—and not from that of the naval architect. The object aimed at has been a statement of the requirements of the different types of vessels which go to compose a properly constituted fleet, based upon a consideration of

their various duties and guided by an unprejudiced investigation of the incidents and events of the two most recent maritime wars. No plans accompany the essay, no attempt has been made to propose exact details of dimensions or designs, and this has been intentional, on the principle that those steps must be left to the professional designer and builder after he has received a clear idea of what is required. At the same time it has been sought to avoid the suggestion of anything manifestly impossible, and the weights, sizes, speeds, etc., mentioned, are never in excess of what have already actually been produced in combination, in certain vessels now afloat. As may be gathered from the contents of the essay, the writer is very strongly impressed with the advantages of homogeneity both in ships and weapons. Five types of ships have been given, it is true, but the division of the cruiser class into three—the presently accepted custom—arises with sufficient reason from the extreme diversity of type prevalent in foreign Services, and the variety of a cruiser's duties. Only one class of battle-ship has been dealt with, however, on the theory that only one class should exist. Smaller battle-ships have their advocates, no doubt, and some strong arguments can be advanced in their favour; but when all is said and done, there is no getting away from the unalterable fact, that the greatest developments in offensive and defensive powers are only to be obtained by submitting to equally great developments in weight, and great weights can only be carried at good speeds, or for long distances, by big ships. In the matter of armaments, the varieties or calibre have been reduced to four, inclusive of every size carried in battle-ship, cruiser, or destroyer. The patterns which go, in fact, to constitute the battle-ship's complete armament, include the patterns used in all the other classes of vessels. This is a step towards homogeneity in the vessels themselves, for their armaments are a necessary part of them, and where homogeneity can be acquired without detracting from the individual excellencies of the different classes, it becomes in itself a characteristic feature of the best types; for a ship must be considered not merely in her separate entity, but as a unit in our fleet.

THE ORGANISATION OF THE VOLUNTEER FORCE.

By Colonel T. STURMY CAVE, 1st V.B. Hampshire Regiment.

Thursday, 22nd February, 1900.

Colonel the Rt. Hon. the Earl of WEMYSS, A.D.C., in the Chair.

MUCH time and thought are usually wasted by the essayist who treats of an army for home defence. He tries to determine to his own satisfaction, and to convince his readers, what are the exact requirements of the case; he indulges in a long preamble as to the part the Navy is to play, and speculates on the possibilities of its success, or what we all hope is but a very remote contingency—its failure.

All this is entirely unnecessary. What is wanted for home defence, in addition to the Navy, is an efficient military force, and the larger it is the better will it fulfil its purpose. That purpose is not only to resist any attempt at invasion, but to inspire such respect on the part of possible enemies that they will be unlikely to make the attempt. The more this result is attained the freer will be the fleet for the exercise of its enormous responsibilities over the whole surface of the sea, which the interest of our vast Empire requires us to dominate. It may seem a paradox, yet it is a fact that the readiest means to ensure our naval supremacy is to organise our military forces for home defence.

At the present moment we have over 400,000 troops at home, as well as the field force in South Africa, and the garrisons in India, Egypt, and elsewhere. Yet we have nothing resembling a field force for home defence. Regulars, Militia, Yeomanry, and Volunteers alike lack the organisation which constitutes any efficient army. Half the force we are relying on consists of men whose training as well as enrolment is voluntary. It is with the organisation of these 230,000 Yeomanry and Volunteers, and their possible increase to 300,000 that I am asked to treat. If I do so without alluding to Regulars and Militia, or attempting to construct one scheme for the whole, it is not because I am convinced that each should be organised on a separate basis, but because I am limited, by the terms of the invitation of the Council, to the Volunteers, which I hold to include the Yeomanry.

No military force can be efficient unless it is organised into a field army. Mr. Wyndham stated in the House that "regret had been expressed that we have not attempted to form an army corps of auxiliary forces," and he went on to say it was not a practical proposal at this moment. To form an army corps out of the auxiliary forces is hardly an adequate way of expressing the problem, it should be rather to construct out of the Volunteer force a field army; and regret may indeed be expressed if this cannot be done, for that would be tantamount to stating that the Volunteer force is not capable of becoming an efficient military machine. We are told that nearly every battalion and artillery unit has an allotted place in the scheme for home defence, that is to say, the passive defence of London, by the occupation of selected positions. Such a scheme is foredoomed to failure; however long an immobile force can hold out in a prepared position, its end is certain to be defeat; it may repulse the most desperate attacks and assaults, but if it cannot pursue it can never gain a real victory. All history tends to prove that whatever the weapons or the circumstances, mobility is necessary to make a military force efficient.

I venture to affirm that the task of creating a field army out of the Volunteer force is not only possible but is not by any means difficult. Organisation is what is necessary, and to determine the details of a sound scheme it may be as well to state categorically what are the objects to be achieved by organisation. They are:—

1. The co-operation of all arms.
2. Mutual confidence.
3. Mobility.
4. Supply and distribution.

A careful study of the first item in the catalogue is an educating process for the officer by itself. The co-operation of the three arms on the battle-field is called tactics, on which subject there is ample literature; but however well officers may know their books, they are likely to fail in practice unless they are accustomed to work in the field, which makes them familiar with the actual conditions of which they read. Hence an organisation is necessary which should constantly bring together in the field for manœuvres artillery, cavalry, and infantry.

The organisation to effect this must be permanent, so that it associates together time after time the same units. With the haphazard system indulged in even in the Regular Army, when units are brought from all quarters without any organic association, there may be scientific combination, but there will not be that mutual confidence which is begotten of comradeship, and which on the battle-field gives a strength and a sense of security to everyone engaged.

It is the habit of some critics to sneer at Continental systems, but it was the permanent association and constant peace practice of the details forming the several army corps of the Germans that gave them the mastery over the French in 1870. The generals in each corps knew each other, they knew the personal equation of their subordinate commanders, the regiments, squadrons, and batteries were accustomed to act together,

and knew what to expect of each other; this engendered in the brigade, the division, and the army corps that mutual confidence amongst the battalions, batteries, and squadrons, that existing amongst the men in a battalion gives it its immense superiority over an armed mob.

Mobility at once on the call to arms cannot be insured without permanent organisation. Our difficulties in every campaign are invariably that the forces brought together lack mobility, and while general officers (who are not always equal to the task) are seeking to invest their force with this indispensable qualification, valuable time is lost, reverses are not unknown, a bad beginning is made, the situation has to be saved by the heroic devotion of the soldier, many lives are lost, and nothing is left but to "muddle through." All this could be avoided if organisation were permanently established in time of peace, and immediate mobility provided for on the outbreak of war.

For that mobility, so far as home defence is concerned, there is no necessity to maintain a complete establishment of draught animals and special carriages—certainly in England civilian horses and conveyances exist in ample quantities—the problem is simply one of training the necessary *personnel* and the borrowing or hire of teams for occasional practice. It is just with strictly territorial forces that this is not only possible but comparatively simple.

Obviously, the first thing to do is to take stock of materials and adjust the proportion required for organisation. There exist for the purpose something over 200 infantry battalions, and encouragement is to be given to bring the strength of them all up to 1,000. It would be better to have said war strength, which is 1,300. But let this pass, and let us assume that we have, or shall soon possess, 200,000 Volunteer infantry. For these the scientific proportion of field or mobile guns would be 1,200. Something under 300 actually exist, but the attempt to make them efficient has been starved by false economy; they have obsolete guns, and have been denied the means for efficient training. In the estimate of cost it will be better not to take them into consideration. The first thing to do in order to create the artillery necessary for a Volunteer field army is to inform the officers commanding artillery corps that henceforth the annual allowance, in addition to the capitation grants and contributions towards camp and other expenses, will be £100 per mobile gun, and to assign to each O.C. a proportion of the 1,200, for which they should at once proceed to provide the *personnel*, either from their existing Volunteers or recruits. The guns should be issued to them as soon as they can be obtained. The existing Yeomanry, about 10,000, would provide from three to four squadrons for each 10,000 infantry, which would be an adequate number for divisional details, but if a few brigades for independent cavalry could as well be raised so much the better. And in view of this it is rather doubtful whether the encouragement suggested for Volunteer battalions to raise mounted infantry companies is altogether wise.

For a more mobile infantry in countries provided with good roads like England and the Continent, the cycle is a most excellent means of locomotion, and for every battalion to have one or more companies of

cyclists would be a very valuable addition. These companies can be brigaded when out for permanent training with first-rate effect.

There is one item in the schedule required for an efficient field army, of which there is at the present time no available stock. That is the corps on which the responsibility of supply and distribution depends. The designation of this corps is constantly being altered; at the present time it is called the Army Service Corps. The class from which Volunteers are drawn is well calculated to make an efficient corps of this nature. For the officers are wanted men of business, owners of wagons and horses, and principals of great carrying firms. For the non-commissioned officers tradespeople and those connected with retail supply stores. The men can and would be drawn from the *employés* of both.

No attempt to "tell off" Volunteers from existing infantry, cavalry, or artillery units will ever make a success of the transport and supply department. Even the officer, sergeant, and drivers for the regimental transport should be men specially commissioned and enrolled for the purpose, and, as the war establishment regulations provide, supernumerary to the company strength.

An attempt to constitute brigade bearer companies on the "tell off" system has broken down; if a similar one be made to create supply columns on existing establishments it will as surely fail. As this appears to be difficult for the organiser, whose work is done at the desk, to appreciate, it may be as well to explain the reason. Recruiting and all the labour of administration devolves in most corps—it should in all—on the company officer, who, being endowed only with the instincts common to human nature, prefers to claim for his own every man whom he has the trouble to enlist, to equip, to instruct, and to admonish; and if the man be called away from the ranks of his company to perform some other duty in which he personally is not interested, he will resent it and, what is worse, soon allow the man to degenerate into a non-efficient or strike him off. Even were it possible to find company officers of such perfection that their altruistic devotion would make them willing to furnish the men, the plan would again fail; in the consolidated corps where the infantry captain and the departmental detail were always on the spot, the man would be in the position of him who had two masters, with the proverbial result; but where in a scattered country corps the man only came under his departmental chief for the brief period of camp, he could neither be properly instructed in his special duties, nor would the mutual confidence between officer and man develop so as to promote efficiency.

Every encouragement should be given immediately for the formation of the necessary Army Service Corps companies. Again, the means must be furnished and a fair estimate of the cost for hire must be promised, £200 per annum in addition to the capitation grant and usual allowances would probably be found sufficient. The Volunteer brigadiers are the right men to entrust with the task. The bearer companies should be also placed on the basis of a completely separate establishment, or made supernumerary to existing battalions. In country brigades the supernumerary

system would certainly be best in reference to the Army Service Corps, as it would remain for disciplinary and financial purposes with the O.C. and the adjutant, and not involve the cost of a separate chain of responsibility and control. Many adjutants have also been through a course of instruction in supply and transport; in future it should be a condition to the appointment of anyone to a battalion having attached to it an A.S.C. company. To which battalions of a brigade these A.S.C. companies should be attached, would be governed, at the discretion of the brigadier, by local circumstances. In London and large centres of population corps of several companies might be formed, with adjutants from the Regular A.S.C., and without any affiliation to battalions. The officers and N.C.O.'s should be encouraged to go through courses of special instruction, and the conditions of efficiency and proficiency should also be laid down suitable to the particular service they would be called on to render.

The formation of Volunteer Army Service Corps companies is one of the most feasible, and should be initiated without a single day's delay.

There is one argument that, however, possesses little weight, which is sometimes used to support the theory that it is not a practical proposal to make Volunteers into a field army, namely, that the men are not of sufficient stamina to undertake the marches, nor is discipline sufficiently strict. Indeed, many are content with no more than a dogmatic assertion that it cannot be done, because they are only Volunteers. It is difficult, however, to believe that such critics can ever have read of the prodigies of mobility performed by the Volunteer army corps of Stonewall Jackson. The Confederate troops both mounted and foot constituted one of the most mobile armies of modern days, they marched incredible distances, fought with desperate valour, and the remnants of the blood-stained battle-fields marched and fought again.

Our own Volunteer force has at peace manœuvres been tested from time to time, and its marching capabilities have not been found wanting. It has ever been my ambition to show, with the battalion I have the honour to command, that Volunteers are fully capable of taking their place in a mobile field force. In 1898, together with the other battalions of the brigade, we carried out manœuvres with two opposing flying columns, striking camp, and marching day by day as the directing staff ordained. Last year, after three days' hard work, we started on the fourth, marched forty-three miles in thirty-four hours, bivouacked in the open for five hours, marched again at two a.m., carried out a night attack and an embarkation. The whole operation involved just upon fifty miles, and was accomplished with ease in less than forty-eight hours. Troops that can do this without exhaustion, and maintain good discipline are surely capable of taking their place in a field force. All that is wanted is the necessary proportion of mobile artillery, the Army Service Corps, the organisation, and the staffs. To effect this, it is a mere matter of providing the means; half a million per annum in addition to the present cost will probably be found ample.

The distribution of this sum may be taken as follows:—

ESTIMATE OF COSTS FOR CONVERTING THE YEOMANRY AND VOLUNTEERS INTO A FIELD ARMY.

	£
Increase of capitation, grants for training, etc., existing establishments, and provision for Staffs	178,000
Increase of establishments and cost of same:—	
Infantry and cyclists, say 30,000	
Artillery .. .. „ 20,000	
Army Service Corps „ 10,000	
Total 60,000 men at £3	=180,000
Special Grants in addition to capitation:—	
For each field or mobile gun, 1,200 at £100	120,000
For each Volunteer Army Service Corps Company, 60 at £200	12,000
For regimental transport for each infantry battalion, 200 at £50 ..	10,000
	£500,000

For this increased annual charge, after providing the modern guns and necessary ranges, the Volunteer force, at present a useless institution, could be turned into a valuable and efficient military machine, which would practically be available at forty-eight hours' notice for the defence of the country; and in saying this it must not be forgotten that the very best possible defence is such a one as the Germans conducted thirty years ago, namely, an offensive defence, when all the miseries of war were experienced in the enemy's country. I do not suggest that the terms of service of Volunteers should be altered, except so far, perhaps, as to render them liable to serve in Ireland; but I have very little doubt that if the emergency arose whole divisions would volunteer for service in any part of the globe, and with the organisation of a field army such services would be accepted on the sound basis of intact units, and the necessity of scratch companies, provisional battalions, haphazard brigades, and chance divisions would be obviated. In the place of this there would be the organised mobile unit of the three arms. The leaders would be known to their men, the men would be understood by their leaders, there would be the co-operation of the integral parts of the machine already fitted together, and made to work smoothly by peace practice. The prospect appears worth the price.

And now to deal in detail with the scheme indicated, first as to the increase of numbers, it may be said at once that without organisation an increase of numbers will only add to the bulk and uselessness of an inefficient force, but with organisation the greater the number the more effective the army.

The Government has indicated that it does not desire to set any limit to the enrolling of volunteers, but rather that it wishes to take advantage of the splendid spirit which is manifest all over the country. Sanction has been given to make up every battalion to 1,000, and, if still more are forthcoming, to make one battalion into two. This does not seem altogether a scientific method. A far better plan would be to issue an order which would substitute the war establishment tables for the establishment tables now in the Volunteer Regulations. That would immediately give scope for the addition of some 30 or 40 per cent. to the force where they were forthcoming without in any way upsetting the administrative arrangements. It would not involve the appointment of additional adjutants, which is a very important matter, for good men can ill be spared from the Regular battalions at the present moment. The war establishment gives a company of 116 for the front, and 10 per cent. at the base, say 127, with all regimental details, band, transport, etc., supernumerary to this figure, and to this should be added as many cyclists as can be obtained. The Government suggests mounted infantry, but there are few places where this could be done without interfering with the Yeomanry and the mobile artillery. It would be better to leave all the horse-mounted force in the hands of these two organisations. As a means of rapid locomotion for infantry in a country like England and in most parts of the Continent there is nothing like a cycle, and if every company could obtain a section of not less than twelve cyclists, a splendid force of mobile infantry would be at hand.

In reference to making battalions of over a 1,000 into two, it is not quite clear what is intended; but if it be that they continue as one organisation under a commandant, there is much to be said in its favour, only it should be aimed at making these double battalions sixteen companies strong. In this paper it was not intended to touch on the training, but here, in my opinion, the question of training turns somewhat on the organisation, as it relates to the strength of the battalion.

The suggestion has been made that the force should this year be trained in camp for one month. One month, two months, or any other period, are possible if it be called out in accordance with the terms and intention of the Act, as a preliminary step to a possible invasion; but as a mere peace-training one month is not possible. As the voluntary system of training is to be adhered to this year, the better plan would be to adopt brigade training for a fortnight before harvest and a week's manœuvres after harvest when the organisation would have been completed. For the ordinary annual training for times of peace it would be best to aspire to one fortnight only, and this turns much on the question of strong battalions. It is useless to attempt to train effectively with a mere skeleton force. One of the most important elements in training is to practise officers in handling a force approaching in strength what would be at their disposal in case of war. This applies to battalion commanders, and still more to the unmounted captain. I have often wondered how far it would assist a company officer to keep in hand his 115 on the field of battle, that he had obtained a distinguished

certificate at the school of verbal accuracy at Chelsea, where, by repeating the exact form of words in the Red Book, he had set in motion, or brought to a standstill, six guardsmen pipeclayed to perfection, and who can no more help slapping the slings of their rifles with instantaneous exactitude when they hear the mystic words "Present Arms" than can an engine avoid starting when the steam lever is turned on.

It is really necessary that if the training is to be of the best value there shall be a fair muster all the time. Now, from the nature of their employment—which is almost always with the Volunteer rank and file, constant employment—some men absolutely cannot be away from their civil work for more than a week; though officers and non-commissioned officers are often more their own masters. It is, moreover, the officer and non-commissioned officer that require the most training, and it is not unreasonable to suppose that not only for one occasional year, but, as the usual thing, these would be able to manage a fortnight in camp, especially if it were possible to go home for one day about the middle of the time. A double battalion of sixteen companies might then encamp for a fortnight, retain all its officers and most of its non-commissioned officers all the time, and keep up a strength of 1,000 by a judicious system of reliefs. It could stand eight strong companies on parade, have plenty of officers to receive and give instruction in the details of field training apart from drill, and officers commanding and captains would be able to practise handling strong battalions and companies. No doubt it would throw much work on the officer commanding and adjutant to have so large a force throughout the year under their care. The officer commanding, however, would be assisted by the second lieut.-colonel, as is now the case with all battalions twelve companies strong, and to assist the adjutant a Volunteer officer should be appointed; he should be given £100 a year for his services, and entitled to allowances. This appointment should only be conferred on competent officers who had passed all the promotion examinations, and obtained a Hythe certificate. It would set a premium on these attainments, be looked on as an honour, and could not fail to produce an excellent effect on all company officers, for many of them would certainly aspire to the post. When such a double battalion mustered for inspection, or if it were called out for service, it would of course parade as two battalions under the two lieut.-colonels. The system has much to be said in its favour.

We now come to the strength and composition of a brigade. These should undoubtedly consist of from four to six battalions, and some reconstruction is desirable in the present grouping; each, of course, should have a M.G. section, its bearer company, and Army Service Corps company.

It has always seemed strange to me that in all Armies there should be but two brigades to a division: these, even with the divisional artillery, only give the divisional general three units to control, and he might, I should think, very well do more. It is true with Continental organisations that the regiment of three battalions more nearly represents our brigade, so that with two regiments to a brigade and two brigades to a division the foreign divisional commander has twelve battalions under him. I would

suggest that Volunteer divisions be composed of three brigades, and nine six-gun batteries, and four, or if possible, six squadrons, with engineer, medical, and army service corps details.

We now come to the vexed question as to whether the divisions should be further grouped. I know that the term "army corps" exercises an influence over many critics much as the red flag is supposed to exercise over the bull; but I am not discussing terms and phrases. The difficulty of stopping short at the division is that no great battle can or will in future be fought with less than 150,000 or 200,000 men in the field. Now, even if divisions are made up to the strength I suggest, such a force must consist of ten to fifteen divisions, and it seems to me no general could possibly direct as many separate units as this in the field; hence a grouping of divisions is necessary. Moreover, if one is to believe the records of artillery fighting, such a grouping is desirable for the proper control of that arm. Call it an army corps or what you like, a grouping of divisions is necessary that the control of not less than three or four should be under one general officer, who should have on his staff an officer who would be in command of all the guns, to control their united energy in action, and to insure their proper training and efficiency in peace. Indeed, that this grouping should be a permanent organisation in peace is to my mind as essential as that the battalion or brigade should be similarly permanent.

Promotion should, as much as possible, be in the division and in the army corps—I cannot find another name for it—so that the same officers would be associated with the same men. The test of efficiency should be results. The corps command should be filled by the promotion of the most successful divisional general, the divisional command by the promotion of the brigadier whose brigade was the most efficient; if there were in some instances Volunteer commanding officers who had produced conspicuously efficient battalions, they should be invited to accept the position of brigadiers. But one principle should be the invariable rule—the best man, whether he be Regular or Volunteer, should be selected. Where Regular general officers were in command there should always be associated with them on their staff one or more officers of Volunteers. Where a Volunteer is promoted to command of a brigade, his senior staff officer should be one who had the main of his experience in the Regulars.

We now come to the question as to whether this is the right time to set about the organisation of the Volunteer force into a field army. It undoubtedly is. Not a single day should be allowed to pass without the work being taken in hand. The public mind is now prepared for any scheme which will increase the military strength of the country. Now the purse strings are unloosed, enthusiasm is kindled in the breast of the would-be recruit—the soldier, be he Regular or Auxiliary, is the hero of the moment. If it is allowed to wait till the war is over the opportunity will be lost, perhaps never to return, till we are overtaken with an Imperial disaster, to which total defeat in South Africa would be as a flea-bite.

When wars are rife and danger nigh,
"God and the soldier" is the nation's cry;
When peace is made, and all things righted,
God is forgotten, and the soldier slighted.

But there is yet another reason why no time should be lost: no one can tell but that the circumstances may not arise to require another field army before the one fighting in South Africa has returned.

Our difficulties are our would-be enemies' opportunities. If the regular salvage corps is deeply engaged in an effort to extinguish a formidable conflagration in the suburb, let us at least organise the volunteer fire brigade ere the citadel be burned down.

Colonel LONSDALE HALE (late R.E.) opened the discussion by stating that in time past military men, even in high positions, had used speech, and certainly in that theatre, to conceal their real thoughts about the Volunteer Force as a factor in home defence. The matter, which hitherto had been somewhat treated as a subject for academic discussion, had suddenly become a very practical question, and, therefore, military men should use speech to express their real opinions about the Force. He was opposed to the scheme propounded by the lecturer, because the needs of 1900 were entirely different from those of past or future years, and the scheme did not comply with the needs of the present pressing emergency. An army for home defence has now to be improvised as rapidly as possible; and all military history teaches that the soundest method is to utilise as a nucleus the best trained troops still available, and to graft on them the less trained troops; but in this scheme the least trained are to be formed into an army by themselves, without any regard to the existence of better trained troops available in the country. The lecturer had rightly laid stress on "Mobility to call to arms." For organising purposes, battalions of the Regular Army and of the Militia are mobile battalions, as battalions. The authorities know the numerical strength of each, and can avail themselves of the whole of that strength; therefore, the battalion as a whole is mobile. But with the Volunteers, the authorities cannot treat the whole of each battalion as mobile in the same sense of the word. The Volunteers are in private life part of our existing working social system, from which they cannot be detached without affecting the working of that system. The taking a Volunteer battalion *en masse* from some quiet, commercial, business or shipping centre would probably lead to a great disruption of business. A battalion taken from Elswick would disturb the supply of armament. When all work except fighting is suspended in the kingdom every battalion is mobile in its entirety. The Volunteer Force should be classified in two or more "bans," the first consisting of men available at any moment, either for fighting or for training; the second, those which can be less easily spared from civil employment; the third, those whose services can be utilised only as a last resource. The practical and numerical value of the force cannot at any moment be determined until the number of men of each "ban" in each individual Volunteer unit has been ascertained. Colonel Hale said that he regarded the Volunteers as soldiers, and not as they had been spoken of in another place by the Under Secretary of State for War, as "Citizens who kindly give some of their time to the service of their country." The same high authority has asked, "Could there be anything worse in the world than to discourage the Volunteers by telling them that unless they gave a certain amount of time to their work they would be useless as soldiers"? As the Volunteers are men, not children, it is just as well to tell them the truth, irrespective of any risk of discouraging them, and that is, that unless the great mass of the individual Volunteers do not give more time to their work they will be useless as soldiers.

Captain R. J. MACDONNELL (late 81st Regiment):—The discussions which take place in this Institution are always interesting and instructive, and the lectures must always call for a large amount of time and attention on the part of those who deliver them. Therefore, for that reason, if for no other, I should like to preface the observations I make on this, one of the few occasions I address the members here, by offering my congratulations and praise to the gallant lecturer for the paper which he has contributed to the Institution. This question of the Volunteer

forces is a very difficult one to discuss, unless it is taken in connection with the Regular forces and the Militia; but as the question put before us relates solely to the Volunteers, I shall endeavour to do my best to keep to the subject before us. But I say again that it is impossible to discuss the question of the future organisation, or even this year's organisation, of the Volunteer Force without taking a view of the whole question in connection with the Regulars and the Militia. I take it that the old lines of organisation must always exist—the Army, the Militia, and the Volunteers. Those forces make up a very large and considerable body, something amounting to 640,000 men. They exist, I presume. In addition to that—I do not know whether I am right in saying in addition, or whether I should say included in that—there is the Army Reserve, a body of 80,000 men. I observe that the lecturer takes to himself the Yeomanry; but I think that will never be; the Yeomanry will never, in my opinion, be attached to the Volunteers. I think they are in organisation and in position more closely allied to the Militia, and, probably, in the future, with the Regular Army. It seems to me to be beyond doubt that there must be a disturbance, and even an entire break-up, of the system which we have hitherto had with regard to our forces. It seems to me, also, that we have at the present time a remarkably strong body of men available for the defence of our Empire and of our country; but I regret to say that, as far as I am able to see, there is no organisation at present. The great heads that control all these various systems are not located in the systems themselves, but are generally located in the Cabinet, or in the Houses of Lords and Commons. They control them. There is no doubt that these forces at present exist. With regard to the Volunteer Force, there is one matter in the lecture which I should be sorry to see carried out. The original intention, and I hope the present intention, of the Volunteer Force is that it should be a defensive force, and a defensive force alone. The object, if I may make the observation, the primary object, of the Volunteer Force is, as its motto implies, *Defencio non Provicacio* (Defence not Defiance). No one is better aware of this than the distinguished Chairman, who himself has borne in the past such a high position in the organisation of the Volunteer Force. It may be forgotten by some of the younger men, or overlooked by the older men; but Lord Wemyss has rendered great service in the past, beginning with the year 1859, and devoted a large amount of time, attention, and money to the subject. You Volunteers are a defensive force, you are resident in this country. You are—may I use the expression?—a citizen force, a commercial force; your duties and your obligations to the country are for making money to pay taxes. You cannot be asked to go abroad, but in the lecture which the gallant colonel has delivered I see he says: "I do not suggest that the terms of service of Volunteers should be altered, except so far, perhaps, as to render them liable to serve in Ireland"; (I thought they were liable to serve in Ireland now.) "but I have very little doubt that if the emergency arose whole divisions would volunteer for service in any part of the globe." I have very little doubt also that they would volunteer. But I should like it to be clearly understood, in the interests of the Volunteers and of the country, that the Volunteer Force is meant for defence, and for defence alone. We have been assured by the Prime Minister that there is no nation willing to attack us. I agree with the last speaker that now is the time to endeavour to organise the Volunteers in such a way that they may be of immediate benefit if they are called upon. One word more. Just recently Her Gracious Majesty has ordered the calling up of all the old soldiers. The limits of age fixed are from 22 up to 45. I do not know whether there is any use in talking about it, but I extremely regret that limit of 45. There are many men over the age of 45 capable of defending their own homes although they may not be capable of going on foreign service; and I think, if I may say so, it would have been better and wiser if those who are over 45 had been given a chance of showing their desire to serve their country, and that the limits of the order had been extended to another ten years. I think we have

very good examples of men considerably over 55 doing good work. Our distinguished Field-Marshal himself in command is 68. Therefore, I think if a man is in health and strength, at 55 he is well able, if the emergency arose, to take his place in the ranks again and defend his country.

Captain A. H. EAST (late 1st V.B. Hampshire Regiment):—Being one of those who are, as it were, down at the roots of the tree, I feel a great deal of diffidence in speaking after those gentlemen who are up in the higher branches. At the same time, however, people who are right at the bottom of things get a different view from those who are looking down from above. On that account, therefore, I have one or two things to say which may not have occurred to the other gentlemen who have spoken. First of all, there is a remark in the lecture which I most emphatically object to, viz., that the Volunteers with their present qualifications are a useless institution. Why I object to it is this—that it either implies a good deal too much, or it does not imply enough. In the matter of the defence of this Empire, any institution which is not useful must of necessity be pernicious, because it takes away the men, the money, and the attention from other institutions which might be of some use; and I should be sorry to think that under the active instigation of the lecturer I have been employed for twenty years of my life in perpetuating a useless institution. I have been greatly relieved on this point by Colonel Lonsdale Hale, who has shown the way in which the Volunteer Force may be of some use, and I still hope, therefore, that the Volunteers are not a useless institution altogether. With regard to the remark in the lecture that (the terms of service being left unaltered) whole brigades and divisions, such as the lecturer proposes, might possibly volunteer as formed bodies for service abroad. That, I know, would be an utter impossibility. Volunteers are composed of men, as the lecturer says, mostly in regular employment. Of these men some, as we have seen, are able to leave their employment and volunteer on war occurring abroad. As the pressure on this country gets greater, and the disorganisation of business increases, more and more men would be free to volunteer for service abroad. But there are a great many men in the Volunteers who would not be able to volunteer for service abroad at all, although in the case of an invasion taking place—the original purpose for which the Volunteer Force was constituted—then the whole Volunteer Force would come out; but you cannot take any Volunteer battalion and expect it to go abroad as a whole. An illustration of that case is happening now. A Volunteer battalion was asked to supply a company for its Regular battalion. There was one town with some three and a half companies in it, and I imagine that the total Volunteers there amounted to about two hundred and fifty. Out of those there were only four men who volunteered for service abroad. There was another company in a little country town belonging to the same battalion with about seventy men, and out of those seventy men thirty-five volunteered for service abroad. You will wonder why it was that out of two hundred and fifty men only four volunteered, whereas out of seventy thirty-five volunteered to go. The answer is very simple. The three companies were in a town where most of the men were clerks or in shops, earning from 40s. to 50s. and 60s. a week, whereas the other company were composed of men a great many of whom were agricultural labourers, earning from 11s. to 15s. a week. The 11s. to 15s. a week man was very glad to go abroad, but the 50s. or 60s. a week man could not afford to give up his job. You will find that all over the place. If you want to constitute battalions or brigades to go abroad as formed bodies, you will have to divide your Volunteers into two or three classes. If you are going to divide the Volunteers into two or three different classes in that way, one class to form a battalion for service abroad and another for service at home, I expect it will strike some that those people who are free and willing to go on foreign service are not in their proper place at all as Volunteers. As Colonel Lonsdale Hale has said, we are here to say what we think, and I therefore do not hesitate to say what I think about these things. I agree with the lecture in regard to what has

been said as to training in camp. I am not talking about the year 1899 or 1900, but I am talking generally. I think if we have a sixteen-company battalion with all the officers and sergeants in camp for a fortnight, and the men not less than seven days each, then all could be instructed in their work. I think that is about as much as you can get, unless we are going to have an entire alteration in the Volunteer Force. I entirely agree with the lecturer about the possibility of the commanding officers of the Volunteers being selected to command a brigade. Of course there are exceptions and special cases, but, as a general rule, I think that no officer is of any use as a subaltern who does not work for and believe that he will some day command his company, and no captain or major will do his duty with zeal and enthusiasm who does not believe that some day he will command a battalion; and I am quite sure that of the commanding officers of battalions who have produced conspicuously efficient battalions, the majority have been spurred on to that result with the hope—I will even say the anticipation—that their efforts will be rewarded in that manner.

Captain L. A. C. SOUTHAM (2nd Middlesex Volunteer Artillery):—The lecturer's views have been most instructive, but he appears to have written his lecture with more attention to his upper floors than to his foundations. Before asking *how* to organise any armed force, whether for land or sea service, I think it is first necessary to go into the question of the purpose for which it is to be used, and *why* it should be organised, otherwise it is very difficult to get a proper sense of proportion. The Under Secretary of State for War stated in the House the other day that home defence meant defence against raid and defence against funk. The latter definition may be at once dismissed, for it is surely simpler to educate the ignorant than to raise a large army to allay their fears, and to keep quiet "the old ladies of both sexes." As for raids, surely, if our field army were beyond the seas, the garrisons of our coast fortresses and men preparing to reinforce the field army would be quite sufficient to repel them. As to invasion on a large scale, say 100,000 men and upwards, our fleet, if in existence, especially in these days of torpedo-boats and destroyers, would be quite competent to prevent any such invasion being prepared; and if the fleet were wiped out the enemy would have no need to risk an army, for free communications on the sea are our life-blood. Where the enemy is, there is our frontier; and it is an anomaly in an Empire like ours to chain down a part of its forces in any one corner of it, however important. The German Landwehr served abroad in 1870, and why should not our reserve formations have a similar liability? Any law to this effect would have to be so drafted that no Government could abuse it; and if men cannot be got voluntarily they must be obtained compulsorily. The fate of the Empire is far more likely to be decided on the plains of Afghanistan than on the Surrey hills, and if we are not strongest at the decisive point any army for home defence only, however organised and constituted, will be of no avail.

The Hon. CONRAD DILLON, M.P.:—I had the honour of serving in the Volunteers, both in the ranks and with a commission, some years since, and I venture to think that the real question we have to face is how we can get the men. Mr. Wyndham, the other day, said he wanted 50,000 more men in the Volunteers, and what we have to do, and what we need only consider to-day, is how we can get men to go into the Volunteers and year after year give up their time to get a thoroughly good training. I contend that the Volunteer practically is a soldier, if he is anything at all. As we have seen, the Volunteers are ready to take their place in the ranks, and if they have experience they will, no doubt, be far more useful than the recruit who has only just come in and never shouldered a rifle or heard a word of command, and he would be able to take his place in the Army whether, it may be, at home or abroad. But what we have to do with our Volunteer Force essentially is to train the young men of this country to use the rifle, train them to move about country, and train them to do all the work that is necessary in the Army—get as much out of them as you can without interfering

with their civil employment. To make a mobile force, and to take men away for a long time from their homes, is, as has been said, an utter impossibility. I have known Volunteers in London who have given 80 or 100 nights during the year to drill. But the real difficulty that we should have in training the Volunteers is the waste of time in taking people to and from some place where they have never been before and where they will never be again. It is all very well to do this once. I was out in the manœuvres of 1871, and I was also at the manœuvres of 1873. During the latter it was wet. I know you will not get men to go out year after year into places where they are exposed to wet and knocked about, when they have not the enthusiasm of war going on. Sir Charles Dilke pointed out in the House, the other day, that we could get these men this year, but he said what we want is in times of peace to train a man, and you must give him something for it. I contend the one thing we shall have to do in this country is not to provide conscription, because I do not believe in it, and I hope, please God, we shall never have any such thing. I do not see how anybody brought up as an Englishman could wish to have a number of conscripts put into the field of battle with him. I believe going in as with a team of football players, every man willing to do the utmost he can for the honour of the body to which he belongs. That is the way we have fought in the past, and I hope that is the way we shall fight in the future. But we must train our men as much as possible. There is one condition absolutely necessary, and I believe it will be realised both for the Army and for the Volunteers, viz., that we must change the conditions under which the men serve. I am speaking of the physical conditions. At the present moment the accommodation which is provided for soldiers is inferior to what is provided in civil life for men of the same class. People are accustomed to have baths. I heard an old soldier laugh at the idea of baths. But I contend it was clearly shown in the Salisbury manœuvres that the men were very keen to have more accommodation for cleanliness than would have been thought at all necessary in past times. I contend that what we must do in the Volunteer Army is to have camps which are within easy distance of London, or of the large towns, where men can go out and where they will find huts which will keep their clothes dry. Here they will not waste time in going to and from the ranges, but can have them at hand, made in cuttings (like railway cuttings) 300 yards long, where men can have a great deal of target practice under cover, so that they can fire every day. By all means, if you like, take them out for manœuvres and work them together. Let the camps be sufficiently large so as to increase their size in the summer. I contend it is folly to waste time in making your men learn to cook, and do all those things which are of a domestic character, and which take up time. You will be better utilising that time in teaching men real soldiering, and teaching them to use their rifles, which is, after all, one of the most important things a man has to do. When the time comes for the men to go abroad, they must, of course, fall into the ranks of the other forces. If it comes to defence at home, then battalions of Volunteers will be able to hold together. But the present need is to have, as the Secretary of War said the other day, 50,000 more men. Where are you going to get them? You will get men to come out once, but you will not get men to be trained soldiers and to be of any use at all; if you want men to be trained soldiers they must come out two, three, four, or five years; they must have easy access to the places where they can do their drill and shooting, and thus you will be able to take and deal with them in brigades, if you have small camps where a brigade could be dealt with, one brigade against another. You can teach them marching and all those things, but until you take them to a place where the men can learn their work within easy distance of their ordinary working occupations you will not be able to get anything like a force that will be mobile. When you have these men out in battalions or in brigades in one of these small camps, and they are trained, I will undertake to say there will be no difficulty in getting those men to move off quite as quickly as Militia regiments.

We do not want everybody to volunteer for the front; we want the men to be well trained. It is in the time of peace that we want to train our young men and make them efficient, so that when the pinch comes, and they have to take their place in the ranks, they will be of use instead of being an incumbrance.

Lieut.-Colonel F. N. MAUDE (1st V.B. Hants R.E.):—I think, Sir, that the discussion has got rather away from the point. As I understand it, the title of the lecture is "The Organisation of the Volunteer Force," and the question really is, between Colonel Hale and Colonel Cave, namely, whether it is to be altogether a Volunteer Army, or whether it is a case where we are all to do our best—sink all differences and distinctions, all be soldiers together, and make together a strong united Army with the best of both. That seems to me to be the real question which for the moment we have to consider. Our difficulty at the present seems to me really to lie in this, that the difficulty and danger to the country are not great enough. It is too great for a small war, but there is no very great emergency. If we had an emergency which involved anything like mobilising the fleet, or calling the Volunteers up, from that moment all our troubles would more or less cease. We would simply embody regiment by regiment, each in its own district; Colonel Cave's regiment would take the place of the next one in barracks, in Hampshire, just as the Militia take the place of the Regulars when they go. We should be under military law, and in a very few days the transformation would be extraordinary. I entirely agree there with Colonel Cave, that the essential point is that the moment war is declared every Volunteer is under military law, and has to go, whether he likes it or not. If not, he would be a deserter, and would be treated as such. That point is sometimes forgotten. At the immediate moment what we really want is a force which will impose on our friends on the Continent to such a degree that they will think twice before they attack us. It is certain that the average well-educated German or French staff officer, who really knows his history, has a very high opinion of Volunteer soldiers. He knows that our Volunteers are a different thing altogether from the raw "mobiles" of 1870. He is aware of that; but still, he does not respect bodies made up throughout of the same material. It is exactly what Colonel Hale said is the case—that if you want to make these people respect us, you must have battalions with a backbone of training — steady, seven-years' trained soldiers; and to my mind nothing could be easier than to arrange that now. Instead of forming reserve battalions, as I regret to see is going to be done, all we have to do is to post a proportion of 20 per cent. of these really splendid men—none of them much under 30 and none of them over 45—into our Volunteer battalions. Let them live in our drill halls, if you like; we could easily arrange for that. Let them serve as the nucleus around which the others are to form, and it would be a transformation scene. They would help us. The spirit between Volunteers and Regulars, particularly in the ranks, is exceedingly good; and if people would only consent, for a short time, to drop all jealousies, titles, and gold and silver lace, we could do very well, I think, in the case of a really great emergency coming. We often talk of the need of compulsory service, but I think there would be no need for any such law at all, because the fact exists. Within ten days of the outbreak of a war the insurance rates would be up so high that I should say, practically speaking, all the smaller employers in this country would be ruined. There would be no raw material to work up, there would be no money to pay wages, and it has been carefully estimated that there will be close on 4,000,000 people out of work. What are we going to do with those 4,000,000? If you enrol 2,000,000 of them on the nucleus already given us by the Army system, which is an Army system and not a system of purely Militia, Volunteers, and Regulars, we can absorb these 2,000,000 in a very short time, and they will be very glad to come. I think, as a permanen organisation all we really need do is to draw a few lines, almost on paper, and arrange that each battalion in turn should be supplied with a backbone of trained

soldiers, and the men who will be driven into it can be absorbed each in turn and sent on to the front.

Colonel H. H. A. STEWART (late the Norfolk Regiment):—On looking at the title of this lecture, besides thinking that we have been a little discursive in going into conscription, and so on, I cannot help thinking that Colonel Hale has been, in his vigorous speech, a little too hard on the lecturer. The title of the lecture is not "The Organisation of the Volunteer Force in the year 1900," but "The Organisation of the Volunteer Force in the Future." As conscription has been spoken of, although I consider it is beside the question to-day, I am of opinion (as I have frequently said in the theatre of this Institution) that the voluntary system has never been given a fair chance of success. The soldier has never been offered what he is worth. An able lecture was delivered in this theatre early in 1898, and in the equally able summing up, the Rt. Hon. Colonel J. H. A. Macdonnald (the chairman) said—*à propos* of an observation that was made by a speaker in regard to the increased offer of pay to the soldier in order to raise 25,000 men then recently voted, viz., that the increase of pay really worked out at an extra halfpenny per day per man—the chairman said, "What is the use of tinkering with halfpence?"[1] The first point I wish to refer to is where the lecturer says that some men absolutely cannot be away from their civil work for more than a week (in the year). I quite believe that is correct. On the principle that the strength of a cable is the strength of the weakest link, I submit that if you cannot get the men for more than a week, a week only should they be continuously trained. I have observed the Volunteers in several parts of England in assembling and going down after their week's training, and I cannot help saying that it appears to me a great deal of time is wasted. Another thing, the number of men in a Volunteer regiment who escape drill (during the week's training) is absolutely portentous. I saw a brigade at drill in the eastern counties a couple of years ago, and I sat down with a number of the men and asked them how it was that they were not in the ranks with their battalions. They gave me as reasons: "Coming off guard," "going on guard," "on picket," "cooks" and "cook's mates," etc. It was just as long a list as the bill of fare of the king in "Bombastes Furioso." They seemed to be getting through their work uncommonly easy in sitting down and criticising their comrades in the ranks. Another point. The lecturer states his bi-battalions, or double battalions of sixteen companies, might then incorporate and so keep up the strength to a thousand. Well, I am inclined to think that he has taken his notion of bi-battalions possibly from his being a bimetallist. We have been told on high authority that a bimetallist is a man who wants to put silver into a melting pot and turn all into gold. Colonel Cave, having got them, wants to put his bi-battalions into the crucible and melt each of them down into a single battalion, and he says that it is a great thing to handle strong battalions. I can only say that from many years' experience at home and abroad—as adjutant of a Line regiment and as colonel of a Militia regiment—I defy any commanding officer to handle singly and efficiently a battalion of more than 700 men (rank and file) in the field. Moreover, a celebrated French general in the Crimea gave this as his opinion.[2] The lecturer speaks, and I think very properly, about an officer in a regiment of Volunteers being appointed to assist the adjutant. My observation as commanding officer of a Militia regiment for many years has led me firmly to believe that the Volunteers as well as the Militia could well furnish excellent officers from their ranks as a proportion of the adjutants of the battalions. I should be very glad to see it tried. One good effect it must have would be to arouse or evoke emulation between the Volunteer and Militia adjutants, and those appointed from the Regular

[1] The Chairman's words were:—"It is no use tinkering away with halfpence . . . giving him [the soldier] what corresponds to the wages of men . . . seventy years ago. . . —JOURNAL, August, 1898.

[2] Bourbaki, I think.—H. H. A. S.

Service, who (the latter), to my knowledge, are not always as good as they might be. The lecturer says that promotion should, as much as possible, be in the division and in the army corps. I submit that is rather academic. You would want four or five different cadres, and I do not think it would act well. As to the test of efficiency in results, I want to know who would be the tester of the efficiency. He would have a most invidious task to fulfil. The last observation I will make is on this—where Regular general officers are in command there should always be associated with them officers of Volunteers. I entirely concur with that. The pity, I think, is that on the Head Quarters Staff of the Army at the War Office, the Militia, Yeomanry, and Volunteers, all three are not represented by a deputy-adjutant-general from their own forces.[1] These forces will never be properly administered until that is carried out. And surely the talent and ability are readily to be found, because we have got, from the Prime Minister downwards, the very best blood and the highest intellects of the country serving as officers of the Militia, the Yeomanry, and the Volunteers.

Colonel STURMY CAVE, in reply, said :—First, I have to apologise to Colonel Lonsdale Hale, and then I have to ask him to apologise to me. I admit that when I was asked to write a paper, the title was to be "The Future of the Volunteer Force." Now, my opinion is that the immediate future of the Volunteer Force ought to be the organisation of it into mobile units of the three arms ; but I am by no means persuaded that these mobile units should exclusively consist of Volunteers, and therefore, I asked the Council, in the person of Colonel Lonsdale Hale himself, if I might make the lecture "The Organisation for Home Defence," to which he demurred, and I understood him to say that I must confine myself to the Volunteer Force. I, therefore, suggested a modification of the title "The Organisation of the Volunteer Force." I have stated in the third paragraph :—"If I treat the subject without alluding to Regulars and Militia, or attempting to construct one scheme for the whole, it is not because I am convinced that each should be organised on a separate basis, but because I am limited, by the terms of the invitation of the Council, to the Volunteers, which I hold to include the Yeomanry," who are, strictly speaking, mounted Volunteers. I should be very well pleased to see in these mobile units, of which I speak, a brigade of Militia and a brigade of Regulars. I should most distinctly like some Regular batteries in each division ; but as I had to confine myself to the Volunteers, I suggested wholly and solely Volunteer battalions, squadrons (Yeomanry), and batteries. Colonel Lonsdale Hale then talked about mobility. The application of the term I do not quite see, but at the same time I see what he means. He says that the Militia is a force and the Regulars are a force that you can lay your hand upon, and, therefore, they are mobile, that is to say, they will come out when you call upon them. So will the Volunteers, every man of them.

Colonel LONSDALE HALE :—May I explain ? I will take the corps of Elswick, furnished by Armstrong. I say they are not mobile, for the reason that the firm, just when the threat of invasion came on, would be working hard. It is not a question of the willingness of the Volunteers to come out, but it would be better for this corps to continue the national work of making guns than to stop making guns and come out into the field.

Colonel CAVE :—I say that every man will come out at once, and must come out, for he becomes a Regular soldier when the 17th Section of the Volunteer Act is put into force. Therefore I say that from the point of view of coming to the colours when called out the Volunteer Force is absolutely as mobile as a brigade of Guards. I regret most extremely that the Government have not got the courage to call us out to-morrow, and I know perfectly well that every man, from the senior colonel down to the junior drummer-boy, would put in an appearance at once. But I want to go on and make them more mobile after they are called out,

[1] I have advocated this for years.—H. H. A. S.

so that we can move them hither and thither as a fighting force, scientifically and properly organised, with their cavalry, their artillery, and all the details that make up an efficient fighting army. That is the idea I have endeavoured to set forth in my paper. That is an idea which I am positive is perfectly feasible if we only had authorities with the courage to undertake the task. Colonel Lonsdale Hale says the question is, What is to be done at the present time? But why on earth put it off? I say it is now that we want it. I say that this field army may be wanted before August, or as soon as the Paris Exhibition is over. We are all now depending on the glories of the Paris Exhibition to keep the peace of Europe. I should not be the least surprised to see that the French may find it convenient to have their autumn manœuvres in their northern province, and if six or seven army corps are mobilised there, I am perfectly certain there will be a good deal of excitement on this side of the Channel. Colonel Lonsdale Hale goes on to talk about differences in the value of battalions, and I rather gather from him that some of those battalions he thought were efficient. He named four. One, I think, he meant us to understand was efficient, two only indifferently so, and one absolutely inefficient. He said, "What would you do with those?" Well, my very essence of organisation is that you may have a permanent brigadier or divisional general who will know where the efficient battalion is. I should say to the commanding officer of that battalion, "Come up higher, and exercise the same influence over the whole brigade or division that you have exercised over the one battalion to make that efficient." With regard to the man who failed, I should see if there was not a second in command or another field officer in the same brigade that I could transfer to the inefficient battalion, and quietly retire the gentleman who had not an efficient battalion under his control. I say that one of the chief, one of the principal, and one of the best objects of a proper organisation is to produce a levelling up to the standard of the rest. Under the present arrangement the man who has control is the inspecting officer, who sees a battalion for two hours in the year. He is a bird of passage, holding that particular birth only for five years. Directly he begins to know anything about the relative efficiency of the units under his command he gets another berth, or is retired altogether from the Army. If he were gifted with the intelligence of a god he could not find out in two hours what was really the state of the case in any particular unit he had to inspect. That is one reason why I want permanent organisations into divisions, as well as to insist on the necessity of practising them in the manœuvres of the three arms, so that they can co-operate altogether properly in the field.

The CHAIRMAN (Colonel the Rt. Hon. the Earl of Wemyss):—It is a comfort to find where one thinks there has been a great difference of opinion that when two sensible men come to explain what they mean, there is really little difference of opinion at all; and so it is between Colonel Lonsdale Hale and the lecturer. Thus I gather from what we have heard in reply that the lecturer does not wish the Volunteer forces to be kept separate from either the Militia or the Regular Army, but that you should have field forces combining the two. That is what I gather, and Colonel Cave admits it is so. Now with regard to myself, I labour under a great disadvantage in a discussion of this kind—I am almost stone-deaf. I heard to a certain extent Colonel Lonsdale Hale when he did not make a tactical movement to the rear, and I think the word "conscription" caught my ear from the Hon. Mr. Dillon. Beyond that I really have not heard the discussion. Further, I think that the subject being the better organisation of the Volunteer forces, my last words in Parliament were such that I am hardly the man to take the Chair on such an occasion as this. What were my words last Tuesday at the close of a rather long speech addressed to the House of Lords? I said:—"I could not but look at the Volunteer Force—looking to the way our military system was now administered—as other than a chronic danger,

and not a source of safety, to the State." Why did I say that? Colonel Cave, in his excellent address, pointed out certain defects in the Volunteer Force, and said that at present it is a "useless institution." Do you think that Her Majesty's Government at present, or at any time in the last forty years, have thought it a "useless institution"? Far from it. It is the shelter trench in which they shelter and save themselves from doing what is their first duty, viz., to administer our existing military system. That cannot be denied. What is our military system? It rests not on "conscription"—that is not the proper word—but upon the fact that every free-born Briton is bound by law to take his chance through the Militia ballot of compulsory military service for home defence, and for home defence only. I ask you, then, as sensible men, whether it is right, if that is the law of the land, for anybody to get up like the Hon. Mr. Dillon and say he repudiates conscription. We all do—everyone of us. But Militia ballot is not conscription. Now, knowing as we do what public spirit there is in this country, and how the Volunteers have for forty years come forward and taken upon themselves a universal public duty, to tell me that if the Government had a little courage—which no Government has on this question—and required every youth of twenty years of age not already serving in the Auxiliary forces to take his chance of the Militia ballot once in his life, and if struck serve compulsorily for two or three years for home defence—to tell me that such a demand as that would be refused by the people of this country is simply a libel on our nation. But if they were to refuse, the sooner we are wiped out by a Boer or a French sponge the better; for we should show ourselves unworthy of our traditions and inheritance. So much for that. But at the present time our whole energies should be given to making our country safe. This war we hope will not last, but there are dangers behind the Boer war. As pointed out by Colonel Cave, the French may have their autumn manœuvres in the north of France, and I have heard from one who is acquainted with an official Englishman on the Continent who knows a good deal about these things, that there is danger ahead; for this gentleman said to me "I am glad you are going in for a large Volunteer reserve, for depend upon it it is essential that England should be as strong as possible in the month of November, after the French Exhibition." Therefore, gentlemen, I think Colonel Cave has done great good in calling attention to the necessity at the present time of organising the Volunteer Force. But when this war is over, and the present anxious time is past, I firmly believe that the best and most patriotic thing the Volunteers could do would be to send in their resignations. That shelter trench would then be gone; the Government would have to do their duty, we should have the Militia ballot, and within six months the Volunteers would come back greatly increased in numbers and in a position to be fully trained up to any standard of efficiency, because they would be under the screw of the ballot for the Militia. I believe, then, honestly and patriotically, that when all these troubles are over that is the only solution and the only way, when we are once more at peace and our troubles are over, to force upon the Government the necessity of the ballot for the Militia in the modified form I have suggested. With regard to our organisation now, let us do everything that is possible in every way. You are wanting in what? In organisation for the field. Thirty or more years ago we had big Armstrong 40-pounder guns of position drawn by agricultural horses, driven by agricultural teemsters. They existed then; you have none now. Why? Because they became obsolete through the great improvement in the ordinary field guns, and no attempt has been made by the War Office military advisers to get a relatively improved big field gun of position. Further, as regards Volunteer artillery, Colonel Creed and Colonel Shakespeare organised at one time batteries of artillery which were most effective, using hired horses and their own artillery drivers, and so efficient were they that on one occasion at Wimbledon I got Colonel Shakespeare to take his battery across a boggy ravine, and when he had successfully accomplished this feat I said to him: "I am certain that at the coming

Dartmoor manœuvres with the Regular troops the Regular field artillery will not go through a worse bit of ground than that." Now, what followed? All Volunteer artillery was suppressed. Why? Aye! Why? Further, as said, an improved big field gun of position has never been made. We have none either for the Regular artillery or for the Volunteers, and we are told with regard to them that the Germans and other nations have them not. That is poor comfort indeed. If the Germans have them not—but, in fact, I know they have—is that any reason why we should not have these big guns? I am all for going ahead of foreign nations, not taking their caps, or their bayonets, or their way of marching, or anything of that kind, but sticking to our own ways, and being ahead of them in armaments. Now, in guns and all things needful for all our forces let us hope we may see improved and perfected organisation for home defence. Take, again, the matter of transport. Every cart and conveyance in a district, every means of transport should be registered and should be at the disposal of the military authorities when required in each military district. I know not to what extent this has been done—if done at all—but it would be a good thing, as a test, if what Colonel Cave has suggested could be done. Do not call out the whole force, but take one district, take it by lottery if you like, and call out the Volunteer force of that district, and see how it is organised for the field. And *à propos* to our want of military organisation, let me say that we are not so well organised now as we were in the days of Queen Elizabeth, at the time of the Armada. Everything then with reference to men, material, transport, food and all things needful, was cut and dried. The number of picks, shovels, nails, hammers, the amount of war stores, guns, food, etc., duly apportioned to each division or company, with suitable and sufficient transport, the whole male population from 16 years upwards being commandeered. All this is in a paper that an old friend of mine, Colonel Riley, found in the library at Althorp—Lord Spencer's—of which he availed himself in drawing up a paper on national defence. This Elizabethan document is a most valuable paper, and I should like it, if possible, to be printed and appended to this discussion, for it will show you how very much more in advance as regards preparation against the contingencies of a hostile invasion they were in the time of Elizabeth than we are in the time of Queen Victoria. I have really nothing more to say, save to express a hope that the result of this discussion will be that Governments and military authorities will turn their attention to the organisation of the Volunteer Force which the lecturer has said is absolutely and entirely wanting at the present moment.

THE SUMMER AND AUTUMN EXERCISES OF THE ITALIAN ARMY IN THE YEAR 1899.

By Captain (retired) von GRAEVENITZ.

(With Two Sketch-Maps.)

Translated, by permission, from Supplement 3 (February, 1900) to the *Internationale Revue über die gesammten Armeen und Flotten*, by F. H. A. Bex, Librarian, Prince Consort's Library, Aldershot.

NOTHING perhaps will produce a more vivid impression of the vast development in matters military which the past century has worked in the dominions of the Great Powers than a close scrutiny of the process of troop-training, with a review of the practical and theoretical exercises arranged for the special benefit of leaders from the lowest to the highest rank.

From the reviews of Frederick the Great to the great autumn manœuvres of to-day—what marvellous progress in such a comparatively short space of time! And, in addition to these extensive operations, with which the military year closes, there are the whole great system of staff rides and war games, of consecutive daily marches and long-distance rides, of mountain and siege operations, of field firing and winter bivouacs, of coast artillery practice and combined naval and military manœuvres, etc.

It is the purpose of this essay to review the principal achievements of the Italian Army in the direction indicated, in connection with an examination of its system and its condition at the end of the last year of the century and proceeding in order of chronology, the cavalry exercises are entitled to precedence.

Opinions as to the worth and condition of the Italian cavalry are most conflicting, but there are two particular sources from which issue general condemnation, although to these too great importance may possibly be attached, viz., the journals which represent the so-called Italian conservative sentiment, which rally round the *Corriere della Sera* of Milan, and the French military press. Our opinion is that the judgment of the former is to an undue degree subordinated to political aims which consider desirable a curtailment of military expenditure and a reduction of the strength of the Army in accordance with the proposals of Ricotti; and, to exponents of such ideas, the expensive cavalry arm naturally furnishes a specially favoured object of attack.

The French press still concerns itself too much with the past. There was admittedly within fairly recent times a certain stagnation in the development of the arm, in consequence of the premature decease of

the Inspector of Cavalry, the Duke of Aosta; but this stage may be said to have been passed over. Attention has already been directed, by an article which appeared in the *Internationale Revue*, so far back as December, 1897, to the measures adopted by the then Minister of War (Pelloux) with a view to completing the establishment of officers, the provision of younger horses, and the introduction and issue of instructions for the conduct of long-distance rides and military race meetings. For the establishment of a third squadron at the School of Equitation in Turin, with a detachment at Modena, as also the revival of the *Rivista di Cavalleria*, now enjoying Governmental support, credit must be given to more recent times still. However, a survey of the work of the summer and autumn of 1899 will give incontestable proof of the truth of the assertion that the Italian cavalry has fully utilised its opportunities of deriving all possible benefit from special exercises of various descriptions, and that in this respect it yields to no other European Army.

A staff ride, extending over a period of three days, took place at the beginning of May under the immediate direction of the present Inspector of Cavalry—an appointment of this character has only been retained for this arm, the artillery, and the Alpine troops—General Mainoni d'Intignano; the locality of the exercise was within the 5th Army Corps district (Verona), and the scheme embraced the reconnaissance duty of two divisions. Skeleton exercises for both brigades of the corps succeeded in the same month and district. More extensive reconnaissance exercises took place from August 10th to 25th in the neighbourhood of Rome, which is specially suitable for the purpose, and were attended by four regiments of the 9th and 10th Corps (Rome and Naples), two light field batteries, and a detachment of engineers. The Inspector was present on three days, and then proceeded to Somma, near Milan, to take command of the cavalry division concentrated at that point and consisting of four regiments, two horse artillery batteries, and one engineer detachment, a total of twenty-four squadrons, eight guns, and about two thousand five hundred horses. The concentration at the camp being completed, divisional exercises were carried out on the ground about Cameri, after which the division marched off to take part in the great autumn manœuvres near Turin. A further series of special exercises were conducted by three regiments, two horse artillery batteries, one Bersaglieri cyclist company near Gallarate in the 3rd Army Corps district (Milan); by two regiments and two horse artillery batteries near Pordenome (5th Corps, Verona); finally, by three regiments and two light field batteries near Capua (10th Corps, Naples). The cavalry regiments at Florence and Bologna were exercised regimentally.

Bearing in mind that one regiment each was allotted to the 1st and 2nd Army Corps during the great autumn manœuvres, it is clear that only a small margin of the twenty-four Italian cavalry regiments, perhaps one or two squadrons per corps, remained available for infantry divisional manœuvres; but the advantage of having nearly the whole of the cavalry drilled and exercised in larger bodies must surely have heavily outweighed that disadvantage. All the more important cavalry exercises finished

up with military races, divided into separate classes for officers, non-commissioned officers and the best horsemen in each squadron. The object of selecting these latter *cavalieri scelti* (five privates or lance-corporals and an unlimited proportion of non-commissioned officers per squadron) is to form a nucleus of men specially qualified for the duties of reconnoitring, reporting information gained, and transmitting orders. The selection depends on the results of an annually repeated examination in cross-country riding, swimming, crossing of rivers, the treatment of sick and injured horses, moving to given points in the open country and on maps, orderly duties, and knowledge of army organisation.

The gun practice of the field and horse artillery was carried out as usual from May to August by regiments on the various artillery ranges. The converted 9-centimetre field gun was tried on the central ranges at Nettuno, as also in four other places. The favourable results expected from the alterations made with a view to improving the gas check, the cartridges, and the buffer mechanism are said to have been realised, the rate of firing having been raised from two shots to from four to five. It is, of course, to be understood that the necessity of replacing the converted 9-centimetre field gun in the course of the next few years by a weapon of *bonâ fide* quick-firing pattern has not been lost to view. The fact of the range of the former being about one thousand metres short of that of the latest German and French guns, and its degree of mobility entirely failing to correspond to modern requirements, cannot be ignored.

The mountain artillery carried out gun practice, as customary, in the mountain regions, the fortress and coast batteries from forts and coast-defence works.

Specially noteworthy was the tactical firing of the 3rd and 4th Coast Artillery Brigades (Tarentum and Messina) in the Straits of Messina. The results are supposed to have furnished fresh proof of the practical impossibility of a hostile fleet forcing the passage of the Straits when exposed to fire from both sides. A recently erected search-light station at Messina brings up the number of such establishments on the Sicilian side to five, and the Calabrian coast possesses four similar stations, which greatly facilitate the work of artillery by night.

The divisional field manœuvres, which took place during the month of August, naturally offered but few points of interest for the foreign observer to enlarge upon. Let it suffice to mention those near Naples, because of the prominent part played in them by the heir to the throne; then, also, those of the 6th Division (Brescia) in the country between Lakes Garda and Iseo, which, as frequently happens in Italian autumn manœuvres, represented all the peculiarities of mountain warfare, although neither Alpine troops nor mountain artillery, but solely infantry, Bersaglieri, and field artillery, the latter armed with the 9-centimetre gun, took part in them. The field of operations lay mostly on mule tracks and mountain passes of considerable elevation, such as the Pass of Maniva, which rises to a height of 2,012 metres. This obstacle was successfully surmounted by the field artillery, after four days

spent in road improvements, solely with the aid of the ordinary resources of a field battery. The manœuvre area being in close proximity to the Austrian frontier, and as the scheme assumed Fort Rocca d'Anfo, on Lake Idro, the base of operations, the exercises were of considerable strategical interest. Similar topographical difficulties were features of the exercises carried out by the 11th Division (Bologna) in the valleys of the Apennines, which extend in a south-westerly direction from Faenza, Bologna, and Modena. Stirring martial events—the landing of the French at Civita Vecchia in April, 1849—were recalled to memory by the general idea of the divisional manœuvres near Rome, which was expressed in the following words :—" A hostile force has landed at Civita Vecchia, and is marching by Tolfa on Rome. Troops from the capital oppose the advance in order to gain time for the arming of the fortress, and to enable detachments from Tuscany and Umbria to hasten to the defence of the threatened capital."

Still, how vastly more abounding in the power of awakening forceful emotions are the historical recollections, but also the memory of anxious thought and care, connected with the names of Mont Cenis and Susa, the region in which important siege operations on a large scale were carried out from August 1st to 23rd. Susa, the Segusio of the Romans, was already in their days the key to the Alpine passes over the present Mont Cenis and Mont Genèvre. It is probable that Hannibal crossed by the former pass; Charlemagne undoubtedly did; and from the time of Charles VIII. many French armies, *i.a.*, Catinat's troops in 1690-4, passed over Mont Genèvre. Susa itself ever since 1035, when the Margraviate of Susa fell to Savoy, has been the object of strife to Piedmontese, French, and German. The charmingly situated picturesque old town is no longer fortified, but the neighbouring forts form to-day the Italian main bulwark against French aggression by way of Mont Cenis, Mont Genèvre, or the Valle della Dora Riparia in the event of the Mont Cenis tunnel, which is, of course, prepared for defence, being forced. These works constitute therefore also the principal defence of Turin, distant only 50 kilometres, and of the district of Piedmont generally.

When to-day the traveller, drawing a deep breath of relief, emerges from the dark confines of the Mont Cenis tunnel, the eye, if accustomed to surveying landscape through military spectacles, discovers along the whole length of the line from Bardonnecchia to Susa, clinging to rocks or barring the valley approaches, forts and batteries, blockhouses and store depôts, telegraph lines and tramways, etc. A noteworthy article in the *Esercito* (No. 91, 1899), gives detailed information regarding the value and significance of these fortifications, which raise Susa to the importance of a fortified camp; but the writer does not fail to explain also that, considering topographical features and the shape of the frontier line, the French system of fortifications bears a distinctly offensive, the Italian a purely defensive character.

The number of troops respectively allotted to the defending and attacking forces in the siege operations referred to corresponded to the

importance of the place. The commander of the former, Colonel Sollier, director of the Turin Arsenal, had at his disposal:—

2 battalions infantry.
1 battalion Alpine troops (Susa).
1 troop cavalry.
3 companies fortress artillery (among them one belonging to the Territorial Militia).[1]
1 company miners.
1 telegraph detachment.
1 artillery artificers' detachment.
1 heavy search-light equipment with a movable "Schuckert" steam dynamo of 8,000 watts.

The reason for not detailing mountain batteries to the defence, thereby depriving it of the arm best suited for a mobile mountain defence force, is not clear. The Alpine battalion had, however, machine guns, which are reported to have rendered good service.

The attacking force, commanded by Major-General Cardone, artillery commandant at Alessandria, was composed of:—

4 battalions infantry.
2 battalions Alpine troops (Exilles and Fenestrelle).
1 troop cavalry.
13 companies fortress artillery (including two of Territorial Militia).
3 batteries field artillery.
2 artillery artificers' detachments.
3 half-sections of sappers.
$\frac{1}{3}$ telegraph park.
$\frac{1}{2}$ miners park.
1 section photographers, with a station wagon.
1 light mountain siege park.
1 light search-light equipment with a movable "Schuckert" steam dynamo of 5,000 watts.

The attacker enjoyed the additional advantage of having four days in which to make preparations, without fear of interference by an opponent.

The chief direction of the operations rested in the hands of Major-General de Maria, artillery commandant at Piacenza. The Minister of War (General Mirri), the Inspector of Alpine Troops (General Heusch), and Major-General the Duke of Aosta were present on several occasions, especially on days when shooting with service ammunition was included in the programme. The operations concluded as the scheme, judging from the strength of the attacking force, seemed to require with the

[1] Bitter complaints are made by a company commander in the *Italia Militare*, regarding the insufficiency of the clothing of the Territorial Militia, particularly their linen trousers and their soft linen head covering, during operations at altitudes of 2,000 metres, combined with frequent exposure at night duty to streaming rain.

spent in road improvements, solely with the aid of the ordinary resources of a field battery. The manœuvre area being in close proximity to the Austrian frontier, and as the scheme assumed Fort Rocca d'Anfo, on Lake Idro, the base of operations, the exercises were of considerable strategical interest. Similar topographical difficulties were features of the exercises carried out by the 11th Division (Bologna) in the valleys of the Apennines, which extend in a south-westerly direction from Faenza, Bologna, and Modena. Stirring martial events—the landing of the French at Civita Vecchia in April, 1849—were recalled to memory by the general idea of the divisional manœuvres near Rome, which was expressed in the following words :—" A hostile force has landed at Civita Vecchia, and is marching by Tolfa on Rome. Troops from the capital oppose the advance in order to gain time for the arming of the fortress, and to enable detachments from Tuscany and Umbria to hasten to the defence of the threatened capital."

Still, how vastly more abounding in the power of awakening forceful emotions are the historical recollections, but also the memory of anxious thought and care, connected with the names of Mont Cenis and Susa, the region in which important siege operations on a large scale were carried out from August 1st to 23rd. Susa, the Segusio of the Romans, was already in their days the key to the Alpine passes over the present Mont Cenis and Mont Genèvre. It is probable that Hannibal crossed by the former pass; Charlemagne undoubtedly did; and from the time of Charles VIII. many French armies, *i.a.*, Catinat's troops in 1690-4, passed over Mont Genèvre. Susa itself ever since 1035, when the Margraviate of Susa fell to Savoy, has been the object of strife to Piedmontese, French, and German. The charmingly situated picturesque old town is no longer fortified, but the neighbouring forts form to-day the Italian main bulwark against French aggression by way of Mont Cenis, Mont Genèvre, or the Valle della Dora Riparia in the event of the Mont Cenis tunnel, which is, of course, prepared for defence, being forced. These works constitute therefore also the principal defence of Turin, distant only 50 kilometres, and of the district of Piedmont generally.

When to-day the traveller, drawing a deep breath of relief, emerges from the dark confines of the Mont Cenis tunnel, the eye, if accustomed to surveying landscape through military spectacles, discovers along the whole length of the line from Bardonnecchia to Susa, clinging to rocks or barring the valley approaches, forts and batteries, blockhouses and store depôts, telegraph lines and tramways, etc. A noteworthy article in the *Esercito* (No. 91, 1899), gives detailed information regarding the value and significance of these fortifications, which raise Susa to the importance of a fortified camp; but the writer does not fail to explain also that, considering topographical features and the shape of the frontier line, the French system of fortifications bears a distinctly offensive, the Italian a purely defensive character.

The number of troops respectively allotted to the defending and attacking forces in the siege operations referred to corresponded to the

importance of the place. The commander of the former, Colonel Sollier, director of the Turin Arsenal, had at his disposal:—

2 battalions infantry.
1 battalion Alpine troops (Susa).
1 troop cavalry.
3 companies fortress artillery (among them one belonging to the Territorial Militia).[1]
1 company miners.
1 telegraph detachment.
1 artillery artificers' detachment.
1 heavy search-light equipment with a movable "Schuckert" steam dynamo of 8,000 watts.

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surrender of Susa when Fort Giaglione, the key to the whole position, had fallen into the attackers' hands. The results served, however, to confirm the conviction that the works, if supplemented and supported by a mobile defence, such as would be immediately available on a declaration of war, would be well able to retard the advance of a hostile force sufficiently long to allay any fear of disturbance in mobilisation arrangements and to enable the necessary reinforcements to arrive from the valley of the Po. Another point to consider is that it would be possible within the first few days of such an attempted invasion to transfer to the western frontier all Alpine troops stationed on the Austro-Italian frontier, where they would not be required; and these are always kept at war strength. From this point of view, and particularly in the matter of *troupes d'élite*, Italy would appear to have a decided advantage of France in numbers.

The great autumn manœuvres in the presence of the King were this year also carried out in Piedmont, the cradle of the monarchy, and were brought to a brilliant close by a parade of the troops, and the solemn unveiling of a statue of Victor Emmanuel in Turin, that provincial capital so rich in historical reminiscences and architecture, and by its numerous monuments so strikingly remindful of the history of the Piedmont-Italian Army. The exercises may justly claim special attention in various aspects. Firstly, any concentration of larger masses of troops must be greeted with pleasure if only considered from the point of interest to the training of soldiers and of all concerned in the leading of troops. Next, no exercises deserving of the appellation "Grand Autumn Manœuvres" had for reasons of economy or in consequence of political unrest, been carried out in the years 1891, 1894, 1896, and 1898.

A cavalry division and a division of *milizia mobile* were on the present occasion added to the 1st and 2nd Army Corps (Turin and Alessandria), bringing the force at the beginning of September in the country south of Turin up to a total of sixty-eight battalions of infantry, thirty-six squadrons of cavalry, and thirty batteries of artillery with one hundred and twenty guns. The whole, reckoning units short of establishment—to which condition of weakness we shall revert—may have amounted to forty thousand men. Lieut.-General Pelloux, commander of the 4th Corps (Genua) and brother of the present President of the Council of Ministers (General Luigi Pelloux), was chief director of manœuvres. The army corps commanders, Lieut.-Generals Besozzi (1st Corps) and Rugiu (2nd Corps), were leaders of proved ability, who during the Italian struggles for independence had gained both wounds and laurels. Generals Heusch and the Duke of Aosta were included in the umpire's staff. The manœuvre ground was, as a glance at the accompanying sketch-maps will sufficiently show, especially favourable; for, irrespective of the rugged south-west slopes of the highland of Montserrat in the east, which reproduced (especially on the 2nd September) a realistic image of mountain warfare, the plain of the Po valley, with its ample network of roads, and its well-developed system of rivers, canals, and ditches, its number of arborial groups and tree-lined avenues, furnished a splendid exercise ground for all arms. The

neighbourhood also recalls historical events in Marshal Catinat's 1694 campaign against Piedmontese and Spaniards, and which ended in his victory at Orbassano (Marsaglia).

But, halt! There are things of greater importance than such reflections, of deeper interest even than the progress of the manœuvres itself, and these are the preparatory preliminaries.

Pelloux's Bill, which, as we know, completely revolutionised existing mobilisation arrangements, passed on July 25th, 1897, when also a period of transition was fixed within which to take all necessary steps to give effect to the measure. This term had now expired, and it appeared urgently desirable to apply a test to ascertain if the time had been properly utilised by military authorities and mayoralties to make themselves acquainted with, and to acquire aptitude in, the practical execution of, their respective duties; to see if the new institutions had taken root; in short, if the mobilisation machinery was in satisfactory working order. This year's great autumn manœuvres, entailing the calling out of large numbers, offered the best available opportunity under the regrettable condition of public funds, which did not permit of a general mobilisation, or even a partial mobilisation of any considerable portion of the forces.[1] Assembly notices, dated 17th August, recalled to the colours for a period of twenty-five days men from a large number of districts of the first category of the years 1867 and 1868 belonging to Line infantry and *milizia mobile* Bersaglieri, also men of the first category of the 1868 and 1869 classes belonging to *milizia mobile* engineers (sappers). Infantry and Bersaglieri officers of the furloughed class and assigned to *milizia mobile* duty, and reserve officers of the 1868 and 1869 classes domiciled within the men's districts, were also called up, and similar demands were made for the services of officers with the bodies of engineer *milizia mobile* affected.

Additional summonses of men of the Active Army for twenty days' exercise were issued on 22nd August. Included were men of the first category of the 1871 class belonging to infantry of the Line and Bersaglieri from all districts of the kingdom (Sardinia excepted, where, owing to climatic conditions, May is the most suitable month), the corresponding contingents of the medical and supply companies from a large number of districts, finally the miners and sappers companies of nearly every district. A proportion of officers of the 1871 class belonging to the districts concerned were also called up. In all arrangements, as also in the preparation of the division of *milizia mobile*, a special point insisted on by instructions from the War Minister, was to observe mobilisation conditions to the smallest detail. Consequently, the commands in the *milizia mobile* division were, as far as possible, filled in the same manner as would be adopted in case of war, *i.e.*, the posts of battalion and company commander, adjutant, and supply officer were given to officers of the Active Army, all others were filled by officers of the Reserve Army.

[1] It appears, however, that the intention of an experimental mobilisation of a complete army corps, including the calling up of all classes of men liable for service, is still adhered to.

The present calling-out of troops gave a large number of mayoralties a first chance of doing what would be required of them in case of war. Pelloux's Bill makes it their duty to deliver to the men reporting themselves the personal mobilisation notice (*scontrini*), which entitles to free passage by railway and steamer, and to despatch the men to regimental depôts or regiments. This provision, which, in the smaller communes particularly, makes considerable demands on the controlling power and energy of heads of communes and their staff, was always considered a weak point in Pelloux's organisation, but apprehension in this direction was not justified by fact. It is unanimously admitted that the concentration was effected smoothly and within the limit of time. It must, of course, be remembered that the present occasion only touched three yearly classes of the *milizia mobile* and one class of furloughed men, whereas in war-time five to six classes of *milizia mobile* and three to four of the Active Army would have to be dealt with; that no men of the cavalry, artillery, and the various engineer branches were called up, and that in respect of the *milizia mobile* only the regions of the 1st and 2nd Army Corps and of the Genoa Division were concerned, all of them districts of Upper Italy in which a stronger military spirit and a better appreciation of the requirements of the authorities exist even in the smaller communes. Want of confidence for political reasons, *e.g.*, mayors being members of revolutionary parties, may, now that all communities elect their own heads, be not quite unjustified in some cases; but such is not so likely to be a factor of such importance in time of peace as would be the case in war-time. The satisfactory results of the present year are, at any rate, a matter for congratulation. The efforts of the mayors, as guided by the mobilisation regulations of 1898 (supplemented by detailed instructions issued in 1899), were advantageously seconded by the co-operation of special officers and non-commissioned officers of reserve who were called up in advance, and it is to be hoped that a similar *personnel* will be also available for employment in case of actual war.

Greater still, and presenting more difficulties, were the demands now for the first time made on infantry and Bersaglieri depôts, to which the new law allotted the task of receiving the reserve men, and of clothing, equipping, and passing them to their units. Some few depôts were, in addition, for the first time required to deal with *milizia mobile*, a duty which formerly devolved on district authorities.

Here, too, the strict observance of the regulations as adapted to the conditions of actual hostilities was insisted on as a positive duty, particularly so with reference to those responsible for the management of clothing and supply details. Five days were allowed for receiving, clothing, equipping, and placing the men in the ranks. The work of the depôts, too, gave satisfaction. Minor lapses may naturally have happened here as well as in the mayors' sphere of action, but, all things considered, it must be said that as Pelloux's organisation proved efficient and practical during the sudden calling-out of troops necessitated by the disturbances of May, 1898, so also in the present extensive mobilisation for the great autumn manœuvres and the embodiment of *milizia mobile*. Such a con-

viction, the result of actual experience, is a moral asset whose value ought not to be underrated.

Next to the work of the mayoralties and troop depôts the *milizia mobile* excited, as usual, the liveliest interest, and this time also it did not fail to make in all respects a most satisfactory impression; even non-Italian spectators of the manœuvres estimate it the equal of the first line of the army in working capacity and general efficiency. The lessons of past years were certainly remembered by the Italians, and the men were not called up as formerly—only just before the opening of the manœuvres—but were ordered to assemble in the camp of Maurizio by the 19th August, *i.e.*, eleven days in advance. The selection of the higher leaders, too, was a most happy one on this occasion, a point which tells greatly in the case of troops of the second line. General Sismondi, whose name came prominently forward in 1895 in connection with a course of lectures on commissariat duties combined with strategical war-games, held command of the division. The brigades were commanded by Generals Stevani and Bellati, the former the victor over the Dervishes at Tucruf. The men, who belonged to the classes of 1867, 1868, 1869, and had been out of touch with the Service for from seven to nine years, most of them with wives and children at home, reported themselves promptly, their conduct was uniformly good, and their percentage of sick was exceedingly low. It was remarkable how quickly men who had been trained with the Vetterli rifle M. 70/87 became familiar in the use of the new weapon M/91. In addition to target practice and the completion of their divisional organisation, which was accomplished by the 22nd, the eleven days in camp were utilised for regimental and brigade drills. Mention has already been made of the method of supplying the complement of officers partly from the Active, partly from the Reserve Army. The question, which is one of the highest importance, of the possibility of, in case of war, being able to find officers in the same manner for the six *milizia mobile* divisions provided for in the mobilisation scheme is much debated; opposition journals, such as the *Corriere della Sera*, dispute it, but the military press, for instance the *Esercito* (V. No. 101, 1899), prove the contrary by reference to the law of 1897 supported by actual figures. It admits of no doubt that Italy stands very well in this respect, far more favourably than Germany, for instance, because the Active Army can supply the regimental commander, three battalion and four company commanders for each *milizia mobile* regiment. There is, on the other hand, considerable ground for uneasiness in the deficiencies disclosed in the strength of contingents, both of the reserve men of the 1871 class and the *milizia mobile* division. With regard to the former, reliable statistics are available. The total amounted to ninety-five thousand men, of whom thirty thousand were drawn for two years' service and nine thousand at once furloughed. Called to the colours in 1891, the class was dismissed in three batches in 1892, 1893, and 1894 respectively. Only Alpine troops were called up for a short training in 1895. The lists still contained the names of fifty-four thousand men, and, allowing twenty-five per cent. (about thirteen thousand five hundred) for further casualties, the present call was

expected to result in the muster of a round forty thousand, but we are inclined to believe that even these modest expectations were not realised. This belief is strengthened by the report on field manœuvres of the 11th Army Corps, which laments the fact of not many more than one-third of the number expected having responded to the summons. It is possible that the conditions prevailing within the district of the capital may be exceptionally unfavourable, but it is certain that they are nowhere such as to lead to only fairly satisfactory results. The muster of the *milizia mobile* was expected to produce thirteen to fourteen thousand men, but the experience of former years was again repeated, the actual figures not exceeding seven thousand eight hundred. The appearance of such startling manifestations admits of three different explanations: Firstly, Upper Italy furnishes the largest percentage of permanent and temporary emigrants. The statistics for 1897 are available and show that of two hundred and twenty-nine thousand eight hundred and fifty-five emigrants, only seventy-one thousand and sixty-nine returned, thus entailing a loss of two hundred and eighty-eight thousand seven hundred and eighty-six, mostly fully grown and robust youths and men. Piedmont and Lombardy accounted most largely for emigration to neighbouring countries, Liguria principally, for permanent emigration. Then also it appears that the enactments for absolving men, specially bread-winners of families, from the obligation of service were this time most liberally interpreted. Dispensation from service by reason of membership in national rifle clubs is the third factor which helped largely in thinning the ranks. Space forbids our dealing here with this question at length, and we would therefore refer for further details to an exhaustive article in the *Neue Militärische Blätter* of November, 1899. Let us, however, say this: the provisions of the law of 1892 on the subject have transferred to an institution, founded on the Swiss system and more or less independent of army control, many important details of the first and periodical further training of large numbers of *milizia mobile* and reserve men, and in military circles a general opinion prevails that such grafting of militia methods on to a regular army system is in no way well advised and is liable to result in grave military disadvantages.[1] The effects of such evils will be felt the more when, as said before, the result should be that in consequence of far-reaching dispensations not more than one-half of the men on the muster rolls are called up, and when, furthermore, exemption on the ground of a certain amount of target practice with an infantry rifle is extended to non-commissioned officers and men of artillery and engineers—branches of the Service which in recent years have experienced such enormous technical changes. A revivification of the declining institution, attempted from time to time by former as also the present Minister of War, must in the nature of things still further accentuate evil consequences in so far as the circle of men exempted from service in the ranks will continue to widen.

[1] Since the above-mentioned article was written, judicial proceedings have taken place in Naples, which led to the discovery of abuses and frauds perpetrated with the connivance of local authorities, and this naturally tended to lower the credit of the institution still further.

The Grand Autumn Manœuvres were based on the following general idea :—

"A southern force is moving between the Tanaro and the Stura di Demonte (a tributary of the Tanaro) on Turin. Its advance guard is formed by the 2nd Army Corps, and has reached Bra. A northern force, the rear guard of a northern army, which had been obliged to retire on Sommariva del Bosco, received reinforcements (the *milizia mobile* division), and prepares to résume the offensive. The southern force is at Bra and vicinity, the northern force at Sommariva del Bosco and vicinity, and at Caramagna."

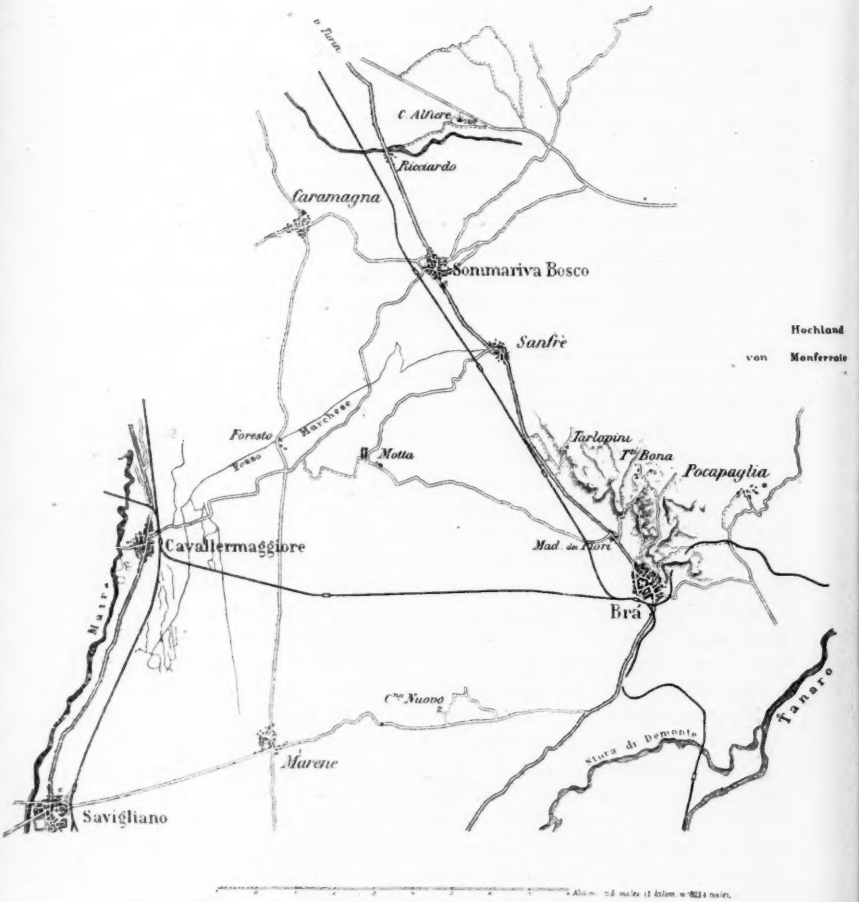
The commander of the northern force had at his disposal for the operations of 1st September the two divisions of the 1st Corps supplemented by some additional troops, the *milizia mobile* division at Caramagna, and a cavalry division at Carignano. The southern force consisted of the two divisions of the 2nd Corps with some specially added units, and a cavalry brigade formed of the two corps cavalry regiments.[1]

The 1st September was devoted to the reconnoitring movements of the cavalry on both sides, the infantry resting. The cavalry division under Major-General Incisa — the Inspector-General Mainoni was general director of the exercises—started before daybreak and advanced *viâ* Caramagna and Marene in order to gain touch of the enemy. The cavalry of the southern force reached La Motta (between Sanfre and Cavallermaggiore) and endeavoured to hold the stronger opponent on the Fosso Marchese, part of the force dismounting for fire action, but was finally repulsed after a series of hard struggles. The cavalry division then marched to Savigliano and joined the southern force. The two corps cavalry regiments rejoined their respective divisions.

On September 2nd, the southern force, in anticipation of an attack by the northern opponent, had taken up position on the heights north of Bra, there to await the arrival of two divisions (assumed) from the southern banks of the Stura. The 3rd Division was on the right at Titti-Bona, on the Sanfre-Pocopaglia road, its flank covered by the 6th Bersaglieri Regiment. The 4th Division, on the Bra-Sommariva road and at Tarlapini, prolonged the line to the left. The cavalry division formed the extreme left, and extended three kilometres on the plain, the Corps Cavalry Regiment on its right keeping up communication with the infantry. Both infantry divisions detached reserves, and a main reserve, supplied by their additional troops, was formed at the junction of the roads at Madonna de Fiori. The cohesion of the troops of the right

[1] The divisions consisted of two infantry brigades of two regiments, four heavy batteries, one company of sappers, half pontoon section, one divisional artillery park, one medical and one supply section, to which were added one Bersaglieri and one cavalry regiment, four light batteries, one telegraph company, one medical and one supply section. The *milizia mobile* division consisted of two militia infantry brigades of two regiments to which were added two militia Bersaglieri battalions, one militia sapper company, also the following line troops : four heavy batteries, one divisional artillery park, half pontoon section, one medical and one supply section. For the composition of the cavalry division, see page 416.

Sketch-Map for the 1st and 2nd September, 1899.



flank of the defence was much endangered by the rugged nature of the densely shrub-grown and mountainous ground. Owing to this cause, and also favoured by a slight mist, the 1st Division of the northern force succeeded in delivering a surprise attack, which paralysed effective co-operation by the artillery of the 3rd Division. As a result of this mishap, two regiments had to beat a hasty retreat, and the whole right flank rolled back upon the 4th Division. The cavalry division, under the Inspector-General, which had assigned to it the special duty of covering the deployment of the two divisions coming from the direction of the Stura, was equally unsuccessful. Moving from Savigliano in the direction of Foresto and La Motta, its advance was met at Case Nuovo, and its further action checked by the reserve of the 1st Corps (four squadrons cavalry, two battalions *milizia mobile* Bersaglieri, one *milizia mobile* brigade). The other *milizia mobile* brigade was still further in rear towards Sommariva.

September 3rd was occupied in marching. The northern force went back into quarters at Carmagnola and San Bernardo and vicinity, assigning Carmagnola to the *milizia mobile* division, which for the 4th was to be attached to the southern force. The latter changed quarters to Sommariva del Bosco and Caramagna.

For September 4th the line Rio Ricciardo-Caramagna was to be held by the northern force acting on the defensive. The Bersaglieri Regiment was on the extreme right, the 1st Division on the Carmagnola-Sommariva road, the main body of the 2nd Division on Hill 286, near the Cascina Alfieri, where also the artillery of the division was massed. A tremendous downpour of rain at 6.30, succeeded by persistent fog, facilitated the advance of the southern troops through the defile of the Ricciardo brook. The northern artillery vainly expended its ammunition against an enemy who had the great advantage of shelter of ravines and copses. The bulk of the 4th Division was now deployed against the Cascina Alfieri ; but, in spite of repeated bayonet charges, no great impression was made at this point. The right flank of the northerners was, however, less favoured by features of the ground, and was obliged to give way. This gave rise to fear of being cut off from the Sommariva-Turin road, to avoid which a retirement by successive brigades from the left became a necessity.

September 5th was wholly taken up by changes of quarters and preparations for the 6th. The programme for that day provided for an attack by a southern army—to be formed by a combination of the two army corps, under General Leone Pelloux, with the cavalry division—against a northern force consisting of three divisions and a cavalry brigade. In accordance with this scheme the *milizia mobile* division had already on the evening of the 4th marched to Carignano to take up at Mirafiori a position covering Turin, in conjunction with two marked divisions at Drosso and Beinasco. During the night from the 5th to the 6th the outposts of this force extended along the line of the Sangone, whilst the Chisola marked the outpost line of the southern army. The infantry of the latter advanced in several columns on a front extending at first ten

Sketch-Map for the 3rd to 6th September, 1899.

kilometres, then gradually contracted to a breadth of five kilometres on the line Drosso-Pte. Sangone. The 1st Corps moved from Vinovo and La Loggia by Nichelino against the opponent's left flank division (marked by the 7th Bersaglieri) the 2nd Corps deployed on the roads west of Stupenigi and attacked the hostile right at Drosso (marked by the 6th Bersaglieri). The leading idea was to make an energetic attack on Mirafiori and to effect a crossing there under cover of strong pressure on the enemy's right at Beinasco. Corresponding to this plan the troops on the extreme left at Orbassano were directed against Beinasco, a simultaneous frontal attack on the enemy's right by troops of the 2nd Corps was also pressed at Drosso, whilst the 1st Corps kept the enemy's left wing engaged. Forcing back the opponent's mounted troops the cavalry division crossed the river at Beinasco and advanced on the Turin road. The right of the northerners became by degrees so dangerously threatened that it had to fall back, and the whole of the northern force then withdrew to a second position on the line Lingotta-Grugliasca. The southern army then crossed the Sangone, principally at Drosso, and the next three-quarters of an hour saw the 1st Corps with a strong force of artillery concentrated on the hill west of the chateau. The crossing thus appearing secured for the whole army, the operations concluded at 10.25, and with them the grand autumn manœuvres came to an end also.

Concerning the general plan of the manœuvres, we have observed that the special ideas of each day's operations were simple—hence, in a military sense, practical. They generally led to a frontal attack supported by a flanking movement, and that appears to be now the normal fighting method of large forces. The repeated transfers from one side to the other of the *milizia mobile* division, the cavalry division, and the corps cavalry appear to have been directed with a view to giving the generals on both sides equal opportunities of handling larger masses of troops, but one feels inclined to think that such measures must have helped to disturb the practical nature and the natural development of the operations, besides entailing waste of time and energy. That, too, appears to have been the reason why the infantry divisions had only three actual fighting days out of the six days' exercises. The connection of one day's work with the other as in real war, the proper provision of outposts, and the due maintenance of the naturally long lines of communication between masses, must also have suffered somewhat in consequence, and opportunities of practice to familiarise leaders, particularly those of the intermediate and highest grade, with such details are not too plentiful in Italy. In the framing of orders and the adoption of dispositions by superior commanders, reports arriving from the outposts during the night and early morning hours appear not as yet to receive in Italy that full measure of attention which they would claim on active service. Military papers make no mention in their columns of outpost duty, except for the night from September 5th to 6th, and it may be added here that the paucity of material supplied by the military press render any exhaustive criticism of the operations most difficult. A

record of special ideas day by day, a critical examination of tactical and strategical dispositions taken, or even a coherent summary of the six days' work, the co-operation of the different arms, etc., is, so far as we know, not to be found in any of the Italian technical journals. The telegrams of the *Agencia Stefani* were frequently misleading, and cannot, therefore, be said to have supplied the deficiency. A very full report in one of the military journals on the work of a cyclist company opens with an introductory remark to the effect that there was sufficient material available for a circumstantial narrative of the whole course of the manœuvres, but it was feared nobody, or at most a few, would read such. We would think better of the readers of that journal.

A representative of the *Temps* summarises his criticism of the work of the troops, and expresses the opinion that the cavalry is lacking in coolness, that in fact the impetuosity of the squadrons had been so great that but for the personal intervention of the King on one occasion the bloodless representation of the image of war would have turned into actual combat. The same tendency manifested itself in the infantry bayonet charges on the Rio Ricciardo which, by the way, seem to have been very freely resorted to. He also laid stress on the rapid expenditure of ammunition by the northern artillery on the the foggy morning of the 4th, and condemns the hasty rush forward of advance guards which frequently brings on serious engagements before there is a certainty of the timely support of the main body. An Italian critic expresses somewhat contradictory opinions and dwells on the limitation imposed on the initiative of subordinate leaders, particularly by the action of brigade commanders, and the excessive anxiety to keep troops massed, without regard to hostile fire effect, in order to keep them in hand. We consider these points to be of greater weight and better justified than the French opinions, the former being based upon an intimate knowledge of Italian institutions.

How few are the opportunities, outside the period of autumn manœuvres, offered to Italian regimental and brigade commanders to exercise themselves and their subordinate leaders in the tactical employment of larger bodies of troops! The low numerical condition between October and the time for calling the fresh recruits to the colours, the many non-military demands on the higher strength during the summer months, the splitting-up in battalion and company garrisons—only a few regiments are kept together in the larger towns—all these drawbacks are well known, but owing to financial stress there is little hope of improvement in this direction. To counteract such disadvantages great value has always been attached in Italy to open country exercises for non-commissioned officers and men, with subsequent discussion on the operations in barracks, and to the working out of tactical schemes (*coi quadri*) for the better training of officers. A decree of the Ministry of War, issued in 1897, regulates this branch of duty, and directs that cadre exercises are to be carried out by six army corps annually after the autumn dismissals of men to the reserve, viz., by the 1st, 3rd, 6th, 8th, 9th, and 11th Corps in odd, by the other corps in even numbered years, and funds varying from 1,500 to 2,000 and 3,000 lire are allotted to different corps to defray

expenditure incurred. Special instructions are also issued in the course of each year for various siege exercises, skeleton cavalry manœuvres, a cavalry staff ride, and a general staff tour. The value of such exercises is undoubtedly high, but they cannot pretend to supply the place of actual troop-leading in teaching value.

An article in the *Esercito* (No. 117), which advocates a step backward, recalls us from our digression to the theme of the grand autumn manœuvres. The author proposes to dispense with the summer exercises of individual divisions, and to return to the system of brigade or divisional encampments, which was abolished in 1892. To compensate for the higher cost entailed by the proposal, he would hold the grand manœuvres only once in two years, but then on the largest scale (employing every combatant and departmental branch of the Service), and based on one clearly defined strategical idea. Viewing the proposal by the light of the exceptional conditions prevailing in Italy, it certainly has in it something alluring, but our space forbids entering more deeply into the question.

We will conclude reference to the written criticisms of the exercises which have come to our notice by quoting a paragraph from the Army Order issued by General Leone Pelloux on the conclusion of the manœuvres :—

"All arms have had the opportunity of giving proof of their progress in military and technical training. The infantry specially gave fresh evidence of its high skill in manœuvring over most difficult ground, an accomplishment which is the distinguishing characteristic of the Italian soldier, and in which he need fear no rival."

In common with the same Order, all other reports agree in recognising the excellent marching of the *milizia mobile* division, and the men's cheerful endurance of the hardships of bivouacs, aggravated by a change of weather from pouring rain to excessive heat. It is not apparent that this division had much chance of taking part in the work of battles, but mention is made of the decisive action of one of its brigades during the combat at Tarlapini on 2nd September.

Great interest was displayed in the work of a cyclist company which took part in the grand manœuvres, and, under the then prevailing normal conditions, justified its existence as a fighting unit, the results of a similar experiment during the 1897 manœuvres having been less favourable on account of continuous rains, with consequent softening of the roads.

Italy commenced experiments as to the practicability of the wheel for military purposes so far back as 1889—earlier than most other European countries—and, the opposite to the German attitude, paid special attention from the very beginning to the question of folding bicycles. Subsequent progress was, however, so slow and deliberate that only about a year ago the Ministry finally decided to establish an independent cycle detachment, to be attached to the Infantry School of Musketry at Parma. Captain Natali, of the 11th Bersaglieri, for years a champion of the new arm, obtained command; and, after ten weeks'

training with 88 men, furnished by the twelve Bersaglieri regiments, he was so far advanced as to be able to undertake a four days' continuous exercise in the very difficult stretch of Apennine country between Fivizzano and Castelnuovo, south of Parma, during which the hills ascended included one of 1,041, another of 1,261 metres elevation. Another series of exercises opened with a ride of 120 kilometres as the first day's work. The tactical and technical experiences gained in the course of these preliminary exercises were subsequently of considerable value to the company which was formed for the cavalry exercises and the grand autumn manœuvres, and was raised to an establishment of six officers and 120 men. Four captains were attached as spectators; also a doctor, a paymaster, and a machinist. Four of the officers acted as section leaders, whilst a fifth closed the rear of the company, and was also responsible, with the assistance of the machinist and four artificers, for the immediate repair of all damages, so as to keep up the strength of the company, so far as possible, to 120 effective wheelmen. The men were dressed in manœuvre order, and equipped with a new pattern light pouch; mess-tin and cloak were attached to the machine. The latter had no bell, and only one lamp was carried at the rear of the company; the component parts of three reserve machines were distributed over the company. The 1st and 2nd Sections were supplied with folding machines of the "Carraro" and "Costa" patterns; the 3rd and 4th Sections had rigid machines of the pattern supplied to engineer troops.

We will quote the substance of that part of an exhaustive article in the *Esercito* on the work of the company during the grand manœuvres which refers to a specified day, viz., 1st September. Being then attached to the cavalry division, the company first of all prepared a crossing for the guns over a ditch, and then covered the batteries whilst getting into action against swarms of hostile cavalry. Next it made timely discovery of an impending flank attack by the latter, and during the ensuing cavalry combat opened effective fire against a hostile regiment formed up in reserve.

The operations of 4th September pointed to the imperative necessity of the unconditional adoption of a folding machine. The half of the company equipped with it was enabled to retire through a dense thicket before a threatened attack by superior numbers, whilst the other half, their clumsy machines tying them to the open, was put out of action.

This incident of the greatest practical importance caused the Ministry of War to subject the machines constructed on the "Carraro" and "Costa" models to a further special test with regard to durability. Two officers and twenty men, mounted on machines which had seen previous service in Parma and during the manœuvres, performed a continuous journey of two thousand kilometres. Here, again, the result was satisfactory, so that it may be expected that the Ministry will proceed with its plan of forming four companies uniformly equipped with folding machines, employing the four captains who had, as previously mentioned, been attached to the original company. It may also be assumed that the

necessary regulations awaiting issue will go further than similar German instructions in defining the work of cyclists in the field, so as to include their roll in the fighting line, especially in combination with cavalry divisions.

In addition to the Bersaglieri cyclist company—specially trained and employed for tactical purposes—a detachment of engineer cyclists was attached to the cavalry division for the exercises in the neighbourhood of Rome and for the autumn manœuvres. Its sphere of action was restricted to the destruction or repair and the practical military working of telegraph, railway, and tramway lines. The equipment was adapted to the purposes indicated, and consisted of a supply of blasting gelatine and sappers' tools in addition to cavalry carbine and one food ration. The main object of this cyclist troop is to lighten the demands on cavalry, which arm suffers universally from a drain of men and horses owing to the many details and detachments which it is called upon to furnish.

Referring to other special experimental formations, the supply of the 1st Army Corps by a field bakery of twelve (system 97) field ovens on wheels deserves first mention. Issues from the first line supply columns were received and conveyed by regimental vehicles.

The supply branch of the 2nd Army Corps issued biscuit bread, which had been prepared in Rome eight to fourteen days in advance, in order to apply a thorough test as to its food value and keeping qualities. The importance of this experiment will be appreciated when it is understood that a decided "bread" question exists in the Italian Army which, though less urgent in barracks, becomes prominent during autumn manœuvres. Then complaints invariably arise regarding the mustiness of the bread rations, due to the presence of an unnecessary amount of moisture (as much as forty per cent.). No experiments were made during the manœuvres with motor cars, which might have proved useful in accelerating the transport of bread.[1]

It was intended to have made use of experimental kites for the transmission of orders from manœuvre headquarters. The kites were to be of ordinary construction, but made of muslin, cambric, or silk, and they were to be employed for giving the signals for the commencement or cessation of operations, to notify temporary pauses, etc. The experiments were not actually made, probably owing to frequent fogs.

The captive balloon—half balloon section was attached to the 2nd Division—was only used once on the last day of the manœuvres by Lieut.-General Sismondi, and gave satisfaction. The fog may have been the principal cause of its previous non-employment, but one may also suspect a little prejudice against the new introduction with a possible slight amount of friction between combatant and "learned" technical elements in the background.

Great advances have to be recorded with regard to the good relations between civil communities and the troops. Since 1st July, 1899, all pay-

[1] As to experiments during the years 1873-83 see *Internationale Revue* for October, 1899, page 79. A few automobiles were recently purchased and allotted to various corps for trial.

ments on account of supplies in kind to troops on the march and at manœuvres are made on the spot by commanders, and, where possible, even by individual soldiers. This arrangement does away with much writing and keeping of accounts, and the communities concerned—poor in many cases—are relieved of the inconvenience of deferred reimbursements, which sometimes constitute real hardship. What is still wanted, however, is a uniform law relating to supplies on requisition, the Sardinian laws of 1836 and 1861, the Austrian law of 1851, and the Papal law of 1867 being still in force in various localities.

The Red Cross Society formed four field hospitals of fifty beds each, of which that supplied by the Bologna section was used during the grand manœuvres.

For field post duties each army corps had one postal inspector, two subordinate officials, and two messengers attached.

Mention should not be omitted of that enterprising and flourishing business institution, the Italian Officers' Association (*Unione militare*). This society established a branch depôt for the period of the manœuvres at Cherasco (south of Bra), with a staff of cyclists, who followed the troops to receive their orders for goods to be supplied. A similar service was established for the divisional manœuvres of the Palermo, Rome, and Perugia Army Corps.

Representatives of foreign Governments—Germany was represented by Lieut.-Colonel von Jacobi, Military Attaché to the Imperial Embassy in Italy—experienced the greatest kindness and had every facility afforded to enable them to form a correct estimate of the state of the Italian Army. Press reports were supervised by a half-pay staff officer.

A system of granting monetary aid to necessitous families of men called up for duty came for the first time into operation, and, considering economical conditions in Italy, must be considered a highly beneficent measure. The Bill, which was put in force by royal decree, provided for the payment of a daily allowance of from 0·40 to 0·50 lira, with half allowance for each child. Payment was to have been made weekly in arrear, but the ungenerous spirit and red-tapism of some communal authorities allowed them this year to evade the letter of the law; consequently late payments in many instances minimised the beneficial effects of the institution. It would therefore be desirable that the Ministry of War should take special steps next year to ensure prompt payment of the allowances by the responsible communal authorities.

In the same measure as the preliminary measures and the work of preparations for the grand manœuvres gave satisfaction, so also the concluding work in connection with the return of the troops to their garrisons and of dismissing the reservists. The necessary arrangements were in the hands of an army transport commission under the control of the Head Quarter Staff of the manœuvres, and composed of members of the Military Railway Commission at Turin. The return transport of the troops by rail was accomplished without hitch within three days, a result which, considering the risk of accident owing to a simultaneous exceptionally brisk civil traffic, exceeded expectation. The constant and justi-

fiable complaint of lack of carriages on Italian railways is notorious; and this evil is not only severely felt by Italian commerce and the travelling public, but it constitutes a positive danger to mobilisation. Thanks to the initiative of the President of the Council of Ministers and to the former Minister of Communications (Pavoncelli), a large order for railway *matériel* has within the past few months been placed on the market. It comprises about two hundred and twenty engines, four thousand one hundred goods trucks, four hundred and fifty passenger carriages, and fifty baggage vans, and, in view of the increased traffic expected during the jubilee year, it is hoped that the whole additional rolling stock will be available by the opening of the new century. An expert opinion in the *Popolo Romano* states that this only reduces, but does not remove, the danger of a deficiency in engines—to deal only with that side of the question — in the event of mobilisation. To convey by rail only six of the existing twelve army corps about two thousand engines would be required, and at present the total number available was only two thousand and ninety. How many, then, would in war-time remain for the necessities of the civil population? It would surely be impossible to convey bread, other necessaries of life, etc., for the whole population with ninety plus two hundred engines. And what would happen if the question of conveyance arose not of six, but of a greater number of army corps?

A fierce light has been shed on the other side of the Italian railway problem by the civil riots of May, 1898, and the militarisation of the *personnel*.[1] We refer to the *personnel* and its relation to the railway companies and the Government. It is to be hoped that Italy will not rest satisfied with the steps taken by Pelloux in May, 1898, which at that time came as an angel in the hour of distress, but that systematic efforts will never be relaxed to counteract the pernicious work of socialistic agitators among the working staff, and particularly to soothe the widespread irritation against the companies, which seems to be only too justified in many respects. One proof of justification for the bad feeling may be found in the frequent successful legal processes instituted against railway companies by their officials. A smooth working of the mobilisation machinery is, after all, ensured rather by the intelligent and cheerful co-operation of the subordinate railway officials than by their mere sullen compliance with orders.

The increased demands on the working capacity of railways did not, in consequence of the changes of station usual at this time of the year, cease with the conclusion of the manœuvres. It was, of course, impossible to comply with the wishes of the railway companies, who desired the holding of the manœuvres earlier in order to prevent the change of garrisons

[1] See the article in the *Internationale Revue* of January, 1899. The measure has recently been further extended by a special law, which directs that men of the Navy who are in the employ of the railway and telegraph administration, and, therefore, exempt from service in case of mobilisation, are, on completion of their term of active service, to be immediately transferred to complete their further period of obligatory service in the land forces.

clashing with the grape traffic, but the Government accepted the inconvenience to the troops and the higher cost entailed by allowing the regiments to return to their old stations and deferring the movements so as to commence on 25th September.

Farewells and arrivals of the troops from old stations to new, also the reception given to the soldiers during the manœuvres everywhere, have given proof of the cordial relations and the intimate connection existing between the Army and the people, and have also demonstrated that radical and socialistic anti-military agitation has not as yet eaten deeply into the vitals of the masses of the people of the country.

With this gratifying assurance we will close the observations by which we hope to have satisfied our readers that the Army allied to us is working with all its strength, and successfully too, though often under adverse circumstances, on its professional advancement and development.

If we now briefly glance at the work of the Italian Fleet during the summer and autumn months we shall discover the two combined divisions of the Active Squadron on 20th July at Augusta, on the east coast of Sicily, where they were joined on 1st August by a torpedo-boat flotilla from Civita Vecchia, consisting of three divisions of four torpedo-boats each and one division of three torpedo-boat destroyers. The grand autumn evolutions were, as usual, directed by Admiral the Duke of Genoa, and took place during the second half of September in the waters of the Gulf of Gaeta. The profusion of islets in these waters and the necessity of counterbalancing the deficiency in modern coast fortifications along the shore from Cape Circei to Naples by an active naval defence called for the strong muster of torpedo-boats with a corresponding concentration of other naval forces to an extent which, so far as we are aware, has not been seen since the visit to Naples of the Emperor William II. in 1888. There being thus at Gaeta practically all the then available vessels, certainly all worth considering as decisive factors in modern war, the composition of the fleet is not devoid of interest.

The Active Squadron, under Vice-Admiral Magnaghi, consisted of the three first-class battle-ships of the "Umberto" type, viz.: the "Umberto" (launched in 1888), the "Sardegna" (1890), and the "Sicilia" (flag-ship, 1891), the armoured cruiser "Vettor Pisani" (1896), the protected torpedo-cruiser "Urania" (1891). The above constituted the 1st Division. The 2nd Division included the first-class turret-ship "Dandolo" (1878, rebuilt 1899[1]), and the older and slower ironclads "Lauria" (1884) and "Doria" (1885), with the protected torpedo-cruiser "Caprera" (1894).

The Reserve Squadron, under Vice-Admiral Frigerio, consisted of the battle-ship "Lepanto" (flag-ship, 1883), and the protected cruisers "Calatafimi" (1893), and "Goïto" (1887), in the 1st Division, and the battle-ship "Morosini" (1885), the ironclad frigate "Maria Pia" (1863), and the protected torpedo-cruiser "Lombardia" (1890), in the 2nd Division.

[1] The experience gained in the process of modernising the "Dandolo" will, no doubt, decide whether the reconstruction of the older ironclads "Duilio," "Italia," and "Lepanto" is to be proceeded with.

The torpedo-boat flotilla under Torpedo-Inspector Vice-Admiral Gavotti comprised fifty vessels, amongst them the four sea-going torpedo-boats "Avvoltoio," "Aquila," "Nibbio," "Sparviero" (all built at Elbing, 1888).

As at the Susa siege operations, so also here, where important questions of *naval* defence were concerned, detailed public reports were forbidden; hence our observations must be restricted to the What, disregarding the How.

Previous to the arrival of the Duke of Genoa, who, after attending the ceremony of unveiling the Victor Emmanuel monument in Turin, embarked on the royal yacht "Savoia," *en route* to the harbour of Gaeta, landing manœuvres had been carried out; also gun practice by day and night, and at fixed and floating targets, in addition to torpedo-boat manœuvres. The scheme of the latter was based upon the protection of the three approaches to the Gulf of Gaeta between Cape Circei and the islands of Ponza, Ventotene, and Ischia. Next followed an inspection of every ship by the Duke, several vessels being directed to clear for action. An attack on the shore works of Gaeta was carried out on September 18th. Acting on the supposition that the land batteries had been silenced and the garrisons blockaded, and information having been gained of the approach of a relieving force from the direction of Itri, landing manœuvres by the Active Squadron were the next order. The landing of one thousand and ten men in twenty-five boats and fourteen steam pinnaces is reported to have been effected in thirteen minutes, the disembarkation of nine guns with a supply of ammunition in eighteen minutes. On the afternoon of the same day, demolitions were carried out by men of the reserve squadron on the section of railway between Formio and Gaeta, which lies dangerously open to such operations. The evening was employed by all the ships in signalling practice with search-lights. Regarding succeeding operations, we will only mention those of the concluding day, 27th September, which was devoted to a torpedo-boat attack on the two squadrons before Gaeta. The latter had twelve torpedo-boats attached, which, supported by the cruisers "Urania" and "Caprera," formed a long line blocking the harbour entrance. All others, including the sea-going torpedo-boats, had repaired to hiding-places in the waters between the Pontine islands, from which they issued forth at night to make an attempt at breaking through the line protecting the harbour. The attempt failed, only three of the boats succeeding in approaching sufficiently close to launch their torpedoes.

A fleet parade on the 28th and an *ordre du jour* by Duke Thomas, giving high praise to the condition of ships and the efficiency of crews, concluded the exercises.

THE SAILORS OF THE RUSSIAN IMPERIAL GUARD DURING THE INVASION OF 1812.

Translated from the "Voïénnyi Sbórnik."

THE Russian armies in the field were considerably inferior to those of Napoleon on the outbreak of war, partly because a considerable force was engaged in the field against the Turks, another was holding down Finland (then recently conquered), while a third was posted on the borders of the Caucasus. To strengthen as far as possible the army on the western frontier, measures had been taken as early as January to put the Guard Corps in a state to take the field. By the transformation of the Royal Watermen and Sailors of the Yacht into the "Naval Equipage of the Guard," that body came under the Admiralty, and yet, as forming part of the Imperial Guard, was in some degree amenable to the military authorities. Considerable doubt reigned as to which would have the benefit of their services, and it seemed indeed probable that on the re-opening of navigation they would go to sea, when on the 28th February the Minister of Marine suddenly received from General Barclay de Tolly a letter directing the "Equipage" or battalion to march the following Saturday, March 2nd, for Vilna, and the Cesarevich Constantine soon afterwards appeared to congratulate it on taking the field. It was to form part of the 1st Division of the Fifth or Guard Corps, of which he was commander.

It was then at its full strength of four companies of 100 men each, or 8 sections of 15 files each, 3 men going to a file. The 1st and 4th, being flank companies, had the tallest men, the watermen, the other two being for the yacht's crews. The body included 4 boatswains, 4 boatswain's mates, 16 quartermasters, 20 musicians, 1 battalion drummer, 8 company drummers, 4 fifers, 340 seamen, 10 boys, and 6 non-combatants. It was commanded by second-class Captain Kartsov, with 2 captain-lieutenants, 5 lieutenants, 5 midshipmen, a staff-surgeon, a master's mate, and paymaster. One lieutenant was sick and joined later, while Captain-Lieutenant Kolzakov was almost immediately appointed A.D.C. to the Grand Duke.

There was also an artillery detachment, which had two light field-guns served out to it on the 1st March, and took the field on the 5th with the Guard Artillery Brigade, under Colonel Enler, and served with it almost continuously throughout the campaigns 1812-3-4. It consisted of 2 sub-lieutenants (Adam List being in command), 6 petty officers, 1 drummer, 15 bombardiers, 16 gunners, and 1 smith, or 39 rank and file. There was also a transport detachment of some 48 men, which remained behind, the total of those remaining, for one cause or another, being 91, 9 of whom were sick.

The officers wore a dark-green uniform with a white edging, and gilt buttons like those of the infantry in two rows, and on the standing collar and sleeves an anchor with a cable, epaulets with a red edging, long green cloth breeches for winter and linen for summer. The headgear was at first a three-cornered hat without a plume, replaced towards the end of the year for parade by a shako. The arms were a cutlass with a white ivory handle, and a gold frog on a black belt for undress, and on parade a short sabre with a gilded hilt worn over the shoulder on a black leather cross-belt, completed by a pair of pistols, cartouche-box, and gaiters. The senior or field officers had a fringe to the epaulets, and in the field were mounted, the shabrack and holsters of dark green with silver stars of the usual Guard pattern. Those of the artillery had black facings.

The seamen and boys wore a dark-green jacket with a white edging on collar and cuffs, epaulets of red, brass buttons, winter trousers of dark green and summer of Flemish linen, the usual infantry stock, boots, and cloak. The headgear was the usual Guard infantry shako with crossed anchors and a brass crest. In addition to musket and bayonet, 60 rounds of cartridge, and 12 flints, each man carried an entrenching tool. The petty officers were distinguished by gold braid on collars and cuffs, and a short sword or hanger. The two guns were light 6-pounders, of 3-inch bore, drawn by 4 horses, and the tumbrils by 3; 12 men served the gun and 2 were attached to the tumbril.

The pay varied from 2,950 roubles in the case of the commander to 16 roubles 36 kopecks in the case of an ordinary seaman, the officers' pay including an allowance for rations about half as much again as the pay, and keep of servants (four in the case of a second-class captain, one for a midshipman or clerk). Some of the officers had their own serfs with them in the field, as well as riding horses and carts for their baggage, though fortunately they had far less than most of the Guard regiments, and, therefore, were not under the necessity of selling it at Vilna before the retreat began. The Emperor ordered every man a weekly allowance of 4 gills of wine and 1 lb. of meat or fish.

So energetically were the preparations pushed on, that by 10 a.m. on the 2nd March, *i.e.*, sixty hours after the receipt of the order, the corps, with its transport and everything complete, stood ready for inspection by the Emperor on the Semanov Field, side by side with the Rifle and Finland Regiments of the Guard. After a short prayer they marched past, and then, accompanied by a numerous crowd who kept up a constant fire of good wishes, marched to the Moscow barrier, where the Emperor, addressing his sailors, thus bid them farewell:—"Adieu, my children; I hope I am not doing wrong in taking you with me, and that you will do me good service!" As a reward for the promptitude with which they had made ready to take the field, all the officers were granted a quarter's extra pay, and the men a pound of fish, a rummer of wine, and a rouble apiece, and in common with the other two regiments received the Emperor's thanks.

In order to secure the provisioning of the Guard, and prevent confusion on the march, three routes had been marked out, and the sailors and Rifles followed the third of these. Depôts of provisions had been formed at the principal points on the road, each having ten days' rations for two infantry and two cavalry regiments and two companies of artillery ; while at points parallel with the routes, Narva, Pskov, Dinaburg, and Vilna, hospitals had been established. A day's march averaged from sixteen to twenty miles, and every three days there was a "rasttag," which was utilised in drilling with the longer muskets served out at the second halting-place, Porkhov. The sailors were, unhappily, as was not unnatural to fish out of water, not provided for by either of the two departments, Admiralty or War Office, and Captain Kartsov only succeeded, by repeated representations, in at length inducing Lieut.-General Lavrov, then newly appointed commander of the corps, to procure an order directing the War Office to supply what was necessary, and that on condition of the sums being eventually refunded by the Ministry of Marine. Some young "masters" having joined them on the way, they having their flags and signalling codes with them, it was determined to try these signals for military purposes throughout the corps. On 5th April they reached Tverichi, where they remained in quarters till the 23rd May. The time was well employed in practising all kinds of engineering and entrenching. About 20th May troops began to be concentrated at Vilna, and the sailors, amongst others, received marching orders to proceed thither, and on the 28th were assigned quarters in villages near that town, numbering at the time 14 officers, 3 non-combatant officers, and 418 men. It may here be noted that Napoleon's old Guard included a battalion of sailors, formed by him in 1798, and which had earned deathless glory in Spain and Austria. Throughout the campaign they were repeatedly pitted against the Russian battalion, being, like them, employed as sappers. Almost the whole battalion perished at the Beresina.

During the night of the 11th June, Napoleon, without declaring war, crossed the Niémen at Kovno, and on the 15th occupied Vilna; Barclay de Tolly falling back on Smolensk, and after the indecisive battle of Borodino on 4th August, he retreated further on Moscow. That city was no longer defensible, and Kutuzov made his famous flank movement to the old Kaluga road so skilfully that the French wholly lost touch of him, and formed a camp near the village of Tarutino. As a curious instance of the enthusiasm Napoleon evoked, even in a patriotic country like Russia, it may be noted that at an early stage in the retreat the sailors had to guard a bridge they had recently made against the neighbouring gentry and their tenants, who wished to seize it for the benefit of the French. The course of the war as a whole needs no recapitulation here. The sailors were pretty constantly in the post of honour during the retreat of the Russian forces, *i.e.*, in the rear, and found plentiful employment in destroying what might be useful to the enemy, more particularly the mills. A curious incident may here be mentioned.

During the retreat from Drissa, after doing some useful work in picking up and sending on stragglers, a detachment of the "Battalion," after being isolated all night, came up with a cavalry patrol, and continued its march in company with it. On the opposite side of the Dvina they sighted shortly after a patrol of Murat's cavalry, about a musket-shot away. The two parties at once began to call out to and chaff each other, the Frenchmen holding up little barrels of vodka, and calling out, "Camarade, du vodka!" to which the sailors replied that they also were very fond of it. The French, who had seized some of our stores of provisions, then boasted of being well supplied with everything, and said it was thanks to Russian hospitality. The reply of the sailors was not very courteous: they said Russia sacredly observed the laws of hospitality, and that it was the custom of the country to begin fattening pigs in the summer to be killed at Christmas. This ferocious prophecy was destined to a fulfilment which seemed then but little probable.

At the battle of Smolensk the sailors rendered important service by covering the retreat and blowing up the bridges across the Dnieper when the army had crossed. Napoleon's Sailors of the Guard had enabled his troops in the same way to effect a crossing at Rassasuo. The heavy rains rendered the retreat a difficult one, and more than once the pontoons had to be dragged through the mud by hand. As they went along they mended the canvas pontoons without retarding the progress of the troops. The distance from Smolensk to Borodino was 200 miles, which was covered by an army of some 100,000 men in sixteen days, the march being made in wonderfully good order, though pursued closely by an enemy many times superior in numbers and guided by Napoleon. To the rapidity and order of this movement not a little was contributed by the excellent state of the roads and bridges, a conspicuous share in the maintenance of which was taken by the Sailors of the Guard.

At the battle of Borodino their artillery detachment and a company of the "Battalion," under Midshipman Lermontov, took a share which we will describe in some detail. On the right of the Russian position flowed the little river Kalocha, quite dried up by the recent heat, and almost in the middle of its course stood the village of Borodino, from which their army extended to the village of Utita on the old Moscow-Smolensk road. The first-named village was held by the 2nd Battalion of the Guard Rifles with two guns, and volunteers had been called for from the sailors to be in readiness to destroy the bridge over the Kalocha, these being the fifty men mentioned under Lermontov. The reserve were posted at the village of Kniazkovo, under General Lavrov, and comprised the 5th (Guard) Infantry Corps, behind which were posted two cuirassier divisions, and behind them again the Guard Artillery, including the naval detachment. At 4.30 on the morning of the 26th, under cover of a thick mist, Delson's division crept up to Borodino village and fell suddenly on the Jägers, who, owing to the quiet of the evening before, had sent their companies in turn to bathe in the village, although they rapidly formed up, yet they had to fall back after a stubborn resistance,

and the sailors at once set to to destroy the bridge, thus preventing a further advance of the French. The 106th of the French Line, which had crossed, was almost destroyed by the 19th and 21st Rifles, which Barclay de Tolly sent to the rescue.

This attack on the right was only a feint, the real objective being the left wing. In repulsing the headlong charges of the cavalry of Nansouty, Montbrun, and Latour-Manbourg, the 1st Light Company of Guard Artillery bore a conspicuous share; it also came under a murderous fire from a battery of 30 French guns, and after having all its officers except one killed or wounded, and most of its guns disabled, was withdrawn out of action, but not until the Cuirassiers had ceased to charge the Ismailov Regiment. It returned in time to assist in the repulse of the French infantry by the Finland Regiment, these being almost the last cannon-shots of the battle. Thus representatives of the "Battalion" took part both in the beginning and ending of the battle.

The retreat from Borodino was far more disorderly than from Smolensk. The sailors here led the way, repairing the bridges as far as possible. On the 2nd September they entered Moscow early in the day, and stood guard over the bridges by which the troops crossed to reach the Riazan road. The task set them of keeping order was no easy one, as not only were the soldiers hurrying to cross, but thousands of the inhabitants were trying to escape with their belongings. On the 4th, when all the troops had passed, the bridges were burnt by Lieutenant Dubrovine and Midshipman Rimski-Korsakov; the French advance guard had then already occupied the Kremlin. One of the men lost his way as they retreated, was taken prisoner, and accused of setting the city on fire, but managed to escape, and rejoined the corps. The battalion now formed part of the rear guard under Miloradovich, checking the French advance under Murat. On the 20th Kutuzov chose a position near Tarutino, gave orders to fortify it, and formed a camp there, awaiting reinforcements and watching Napoleon's movements. Here the commander, Captain Kartsov, received the Cross of St. Anne of the second class, and a number of other officers were decorated. Here, too, began that guerilla warfare which was to prove the ruin of the enemy. We may notice an attack during the night of the 5th November, made at the suggestion of Bennigsen, in which the Russians, although they lost somewhat heavily owing to the bad timing of their attacks, almost destroyed Murat's corps of 20,000 men and Napoleon's remaining cavalry. Lieutenant Kolzakov was decorated for service as Prince Golitzin's aide-de-camp.

When the Russians resumed the offensive, the sailors were brigaded with two companies of pontoon troops, and were attached to the advance guard, doing all the bridging work. Their artillery detachment marched with them, just as other regiments had artillery attached to them, but rejoined the artillery company at the bivouacs. It took part in the affair near Krasnoï, where Davoust's corps was destroyed. From that point to the Beresina the marches were very arduous. They had to pass through villages devastated and burned by the French, and the frost when the wind was keen reached 20° Réaumur (13° below zero). Uniforms

and footgear were worn out, and the men had to wear anything warm they could get hold of, so that only their arms showed that they were soldiers. On reaching the Dnieper they at last had pelisses and shoes served out to them. Here also the Grand Duke Constantine resumed command of the Guard Corps. On the 5th December that corps, with the sailors attached to it, marched with flying colours into Vilna, where for the first time since June it enjoyed roomy quarters. A large number of wounded French were found in the place, and the naval officers gave up several of their rooms to form a hospital for them, while their surgeons attended to them.

The invasion was now at an end, and on the 11th December the Tsar took over the chief command of the Army. On the 17th he held a grand review, when, according to the "field state," the "Battalion" had the superior officer, 3 other officers, and 27 men sick, and had lost since leaving St. Petersburg 16 killed, 26 died of wounds or sickness, and 8 missing, while the artillery detachment had lost 6 killed and 5 from wounds and sickness.

To conclude, we may mention an incident which has doubtless numerous parallels both in fact and fiction. Kolzakov, who as we have seen, was attached to the Grand Duke's suite, one day, on the march to Vilna, lagged behind, and chanced on one of the many scenes of misery to be found in the track of the retreating French army. A wagon stood by the roadside, the horse having dropped in the traces, and several frozen Frenchmen were in it, amongst them a young officer, whose calm and interesting face struck Kolzakov. Going up to the group to look at him more closely, and taking his hand, he was surprised to find that his pulse still beat faintly, so with the help of his Cossack orderly he carried him to a neighbouring cottage, where he was restored to consciousness with scalding tea and wine. His rescuer would not tell the Frenchman his name, but simply said he was a sailor, and attached to the Grand Duke's staff. When he was sent into the interior he got together 100 roubles to help him on his way. A year later, when the allies occupied Paris, Kolzakov was billeted on a French lady who, he found, had had an only son with the Grand Army in Russia. This son, she said, had been saved from dying of freezing by a Russian officer, and was now a prisoner; but she had had no letter from him for six months. Kolzakov promised to make inquiries, with the result that the lady not long after got a letter from her son announcing that he was liberated, and she then discovered that the officer quartered on her was her only son's benefactor.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Admiral—The Right Hon. Lord C. T. M. D. Scott, K.C.B., to be Commander-in-Chief at Plymouth. Captains—R. White to "Galatea"; E. D. St. A. Ommanney to "Calliope"; H. P. Routh to "Juno"; G. H. Cherry to "Argonaut"; J. E. C. Goodrich to "Colossus"; A. J. Horsley to "Europa"; C. H. Cross to "Revenge"; G. F. King-Hall to be Chief of the Staff in the Mediterranean; Hon. H. Tyrwhitt to "Renown"; L. E. Wintz to "Goliath"; F. J. Foley to "Furious"; F. A. Tate to "Pactolus." Commanders—W. Nicholson to "Cossack"; Mark Kerr to "Cheerful."

Admiral Sir H. Fairfax, Commander-in-Chief at Plymouth, died suddenly on the 20th ult. at Naples, where he had gone for his health. He is succeeded by Admiral the Right Hon. Lord C. T. M. D. Scott, K.C.B., whose flag was hoisted on board the Nile on the 28th ult.

The new first-class battle-ship "Ocean" left Devonport for the Mediterranean on the 13th ult., on which station she relieves the "Hood"; the "Hood" arrived home at Plymouth on the 23rd ult., and has proceeded to Chatham, where she will pay off; after refitting she will take the place of the "Sans Pareil" as port-guard-ship at Sheerness. The new first-class battle-ship "Goliath" commissioned at Chatham on the 27th ult., for the China station, where she relieves the "Victorious," which ship is to return to the Mediterranean, paying off at Malta; the crew of the "Revenge" will turn over to the "Victorious," and the "Revenge" will come home with the "Victorious's" ship's company and will pay off; the "Goliath" will convoy out to China two torpedo-boat destroyers, the "Otter" and "Janus," the last-named being attached as tender to the ship. The sloop "Basilisk," commissioned at Sheerness on the 22nd ult. for the South-East coast of America, where she will take the place of the "Beagle," and the third-class cruiser "Cossack" commissioned at Chatham on the 29th ult. for the East Indies, where she will relieve the "Melpomene." The first-class gun-boat "Harrier" arrived at Plymouth from the Mediterranean on the 1st ult., and paid off at Devonport on the 24th ult. The first-class gun-boat "Hussar," also from the Mediterranean, paid off at Devonport on the 12th ult., and the sloop "Beagle" from the South-East coast of America paid off at Portsmouth on the 14th ult. The second-class cruiser "Pique" left Plymouth for China on the 16th ult., where she will relieve a sister ship, the "Iphigenia." The first-class cruiser "Edgar" left Plymouth for China on the 2nd ult. with reliefs, and the first-class cruiser "Europa" left Portsmouth on the same duty on the 19th ult. for Australia. The third-class cruiser "Comus" returned to Plymouth on the 24th ult. from North America; she paid off on the 31st at Devonport, and her officers and crew were transferred to the second-class cruiser "Charybdis"; her commander, Captain G. A. Giffard, is the commodore in charge of the Newfoundland Fisheries Protection Squadron.

Signal Exercises in the Mediterranean.—Great attention appears now to be paid to signals in the Mediterranean fleet. The following are the results of the exercises carried out during the week ending Saturday, February 24th:—

The "Ramillies," flag-ship of Rear-Admiral Lord C. Beresford, second in command of the station, heads the list, and she seems to have a very efficient lot

of signalmen, if we can judge by the high places men from the ship take in the recent competitions; and Lord Charles Beresford himself, before coming on the station, underwent a course of signalling at Portsmouth.

No fewer than 134 exercises were sent in altogether, 87 of these being forward exercises for the more advanced signal ratings, and the remaining 47 for junior men and for signal boys.

Great credit is due to George Whitby, leading signalman of the "Ramillies," who heads the forward list with 100 per cent., which is the full number he could get, and means that the most difficult and rapid exercises failed to catch him napping.

Towing Target Practice in the Mediterranean.—The following table gives the results of towing target practice carried out by some of the ships of the Mediterranean Squadron when cruising in company on 24th January. The practice was limited to 6-inch guns. The target was towed at about 8 knots per hour, and the distance of the target from the ship firing varied from 1,000 to 1,500 yards. The weather was calm, with the surface of the water slightly broken.

——	Number of men firing.	Rounds fired.	Points made.	Lost shot.	Average points per round.
Andromeda	32	64	687	1	10·7
Theseus	20	40	420	0	10·5
Royal Oak	20	40	405	3	10·1
Royal Sovereign	20	40	390	1	9·7
Canopus	22	48	463	6	9·6
Astræa	6	12	109	2	9·0
Totals	120	244	2,474	13	10·0

These results are fairly good. The proportion of lost shot was small. The "Andromeda" made by far the best average, although no less than 32 men fired, which means that the firing was not limited to the captains of guns, but numbers 1 and 2 fired as well. Taking this into consideration, the results obtained by the "Andromeda" certainly point to a very efficient state of gunnery in that ship, and show that the training has not been confined to a small number of seamen gunners who are crack shots.

Royal Naval Reserve.—With a view to strengthen the Royal Naval Reserve, the Admiralty have directed that, in future, seamen and stokers who are about to be discharged from the Royal Navy on the completion of their first continuous service engagement, or who purchase their discharge, may be enrolled in the Naval Reserve. The drafting officer at each of the home ports, or some other specially selected officer, is to be assigned the duty of enrolling in the Naval Reserve as many desirable men as possible. In ships an executive officer is to perform this duty. When a man applies for his discharge the advantages of joining the Royal Naval Reserve are to be brought under his notice, and the enrolling officer is to formally invite him to join, subject to his being medically fit and in other respects desirable. Men who have completed twelve years' continuous service are eligible to be enrolled as qualified seamen and stokers, although they may intend to reside ashore, and all their naval service will count towards Reserve pension. These benefits do not apply to men of less than twelve years' man's service. The necessary formalities are required to be completed before a man is discharged to pension, as after that he cannot be enrolled in the Royal Naval Reserve, and can only join the Seamen Pensioner Reserve. An annual report on the working of the arrangement is to be forwarded to the Admiralty, and instructions are laid down that men returning from foreign stations on the completion of

their first continuous service engagement, or who may be desirous of purchasing their discharge, are to be made fully acquainted with the terms of the order.

The Statistical Report of the Health of the Navy for 1898.—The statistical report of the health of the Navy during the year 1898 has been issued. The returns for the total force serving afloat for that year may, it says, be regarded as, on the whole, satisfactory. The aggregate number of cases of disease and injury recorded for the year furnishes a ratio of 906·09 per 1,000, which is an increase of 11·28 per 1,000 on that of 1897, but a decrease of 60·04 per 1,000 when compared with the average of the previous ten years. The increase as compared wlth 1897 was principally due to the East Indies station, where a considerable augmentation occurred in the cases of simple continued fever, and also to an epidemic of dengue on board the "Eclipse." The Mediterranean and the Cape of Good Hope and West Coast of Africa stations show a substantial reduction in the ratio of cases, due on the latter station to the comparative exemption from malarial fevers, which show a decrease of 269·81 per 1,000 compared with the previous year. The invaliding ratio of the total force was 28·86 per 1,000, which is a decrease of 3·12 per 1,000 compared with 1897, but an increase of 2·32 per 1,000 contrasted with the average of the last ten years. The death rate, viz., 4·91, is ·32 per 1,000 less than that of 1897, and is 1·94 per 1,000 below the last ten years' average. This is the lowest obtained since the year 1856, when these reports were first prepared in their present form. Eight cases of plague, affecting, however, only seven persons, are returned, and of these four proved fatal. They all occurred on the East Indies and China stations, although three cases with one death appear in the returns of the irregular force. Eleven cases of wounds received in action are shown on the Mediterranean station. They all took place during a fight with Bashi-Bazouks at Candia during the Cretan troubles.

A Year's Sickness and Invaliding.—The total force in the Service afloat, corrected for time, in the year 1898, was 82,830 officers and men, of whom 50,290, or 60·71 per cent., were between the ages of fifteen and twenty-five; 24,130, or 29 13 per cent., were between the ages of twenty-five and thirty-five; 6,930, or 8·36 per cent., were between the ages of thirty-five and forty-five; and 1,480, or 1·78 per cent., were forty-five years of age and upwards. The average number of men sick daily was 3,176·65, which is in the ratio of 38·35 per 1,000, and shows an increase, compared with the previous twelve months, of ·33 per 1,000, but a decrease amounting to 3·02 per 1,000 in comparison with the average of the last ten years. The number of days' sickness on board ship and in hospital in the total force was 1,159,478, which gives an average loss of service from disease and injury of 13·99 days for each person and shows an increase, compared with the preceding year, to the extent of ·12, but a decrease of ·9 day in comparison with the average of the last ten years. The total number of persons invalided was 2,391. Out of the above total, 1,557 persons were finally invalided from the Service, being in the ratio of 18·79 per 1,000 for the whole force, or 65·11 per cent. of the number invalided, showing a decrease of ·11 per 1,000 compared with 1897. The number of deaths was 407.

The average number of entries on the sick-list for disease and injury per man on the Home station was ·85; on the Mediterranean station, ·77; on the North America and West Indies station, ·76; on the South-East coast of America station, ·93; on the Pacific station, ·85; on the Cape of Good Hope and West Coast of Africa station, 1·18; on the East Indies station, 1·32; on the China station, 1·08; on the Australian station, 1·33; and in the irregular force, 1·08. The average number of cases per man in the total force was ·9, practically the same as in 1897, when it was ·89. The lowest sick-rate was on the North America and West Indies stations, and the highest on the East Indies station. The ratio per 1,000 of men sick daily on the Home station was 40 96; Mediterranean, 31·89; North America and West Indies, 29·15; South-East coast of America, 31·23; Pacific, 31·85; Cape of Good Hope and West Coast of Africa, 39; East Indies, 45·58;

China, 41·23; Australia, 39·16; and in the irregular force, 34·22. The average ratio of sickness for the total force was 38·35 per 1,000, which is an increase of ·33 when compared with the preceding year. Compared with the preceding year, there was an increase in the invaliding on the Home, South-East Coast of America, Pacific, and East Indies stations, and a decrease on the other stations, viz., Mediterranean, North America and West Indies, Cape of Good Hope and West Coast of Africa, China, Australia, and irregular force.

Barbette Mounting for Two 12-inch 40-calibre B.L. Guns.—We are indebted to Messrs. Vickers, Sons & Maxim for the following details and the accompanying plates:—This mounting, which embodies some important innovations, is made for the 12-inch B.L. Mark IX. wire guns which were designed and are manufactured by Messrs. Vickers, Sons & Maxim, Ltd. The gun is 40 calibres long in the bore, weighs slightly over 50 tons, and is fitted with Vickers' breech mechanism. It fires a projectile of 850 lbs. with a cordite charge of 212 lbs.

The principal feature of the mounting is the apparatus which enables the gun to be loaded at any position of elevation or depression, either with the gun at rest or in motion. This apparatus is very simple, and involves no additional complication in the present service fittings, and at the same time very much simplifies the operation of loading. The main advantage secured is that the gun can always be kept sighted on the object aimed at, as it is never necessary to alter the position of the gun either vertically or horizontally for the purpose of loading, as has hitherto been the case. This should prove of great value, as the time occupied in carrying out the vertical or horizontal movement of the gun during loading is saved, and allows, at the most, a few seconds for aiming when rapidity of fire is desired. The operations involved in loading the gun are also materially reduced, as neither elevation nor depression is necessary to bring the gun to a fixed position, nor to take it back again, after loading, to the firing position. It may be said, in fact, that the gun is always in the firing position, except only during the brief period of recoil and run-out—at the most not exceeding five or six seconds—and even then, as the gun recoils on the line of fire and the sights are not directly on the gun, the aiming is practically continuous. No locking bolts or gear for working them are necessary to secure the mountings when loading at a fixed position, intermediate between the ordinary firing position and the maximum angle of elevation, which has hitherto been the usual fixed loading position. The rapidity of fire, combined with accuracy of shooting, is materially increased, as compared with the arrangement of mounting not fitted for loading at any or all positions of the gun's movement.

Another important feature is the addition of alternative mechanical methods, first, for running the gun out after recoil to the firing position, and, secondly, for elevating the gun either in its recoiled or in its firing position. The gear for these purposes is entirely separate and distinct from the ordinary hydraulic fittings supplied for performing these operations, and is so arranged that either set of fittings can be used as may be desired without involving any alterations of the gear, except in the simple rotation of a handwheel, which is placed conveniently in the mounting.

The mounting is comprised of the following principal parts:—

1. The turntable, shell chamber, trunk, and other parts of the revolving structure.
2. Training gear.
3. The gun mounting including elevating and sighting gears.
4. Ammunition hoisting gear.
5. The gun shield.

The turntable is built up of steel plates and angles and is arranged to rotate on a live roller ring for which suitable upper and lower paths are provided. The

lower path is fixed to a structure separate from and within the barbette wall, and thereby will not be affected by any distortion of the latter.

The shell chamber is attached to the under side of the turntable and revolves with it.

The trunk is attached to the floor of the shell chamber, and revolves with it and the turntable.

The rollers are provided with flanges at both ends to take the horizontal thrust, and are bound together by a ring to which the roller axles are secured.

The training rack is attached to the turntable and gears with the training pinions, which are actuated from below.

The turntable is arranged to be rotated either by hydraulic or hand power, and provision is made so that only one form of power can be in operation at one time.

For training by hydraulic power two three-cylinder hydraulic engines are provided, which may act either in conjunction or separately. They are situated in a compartment immediately below the shell chamber and are controlled from the sighting stations.

The mounting consists essentially of a gun slide formed by a pair of girders built up of steel forgings, plates, and angles, provided at the front end with two trunnion plates, and at the rear end with a pair of recoil cylinders. The gun-cradle is fitted with grooves, into which the gun is securely keyed, and it is arranged to travel in the upper surface of the gun slide girders. Two trunnion brackets are provided with removable trunnion pins on which the gun slide is pivoted, and around which both gun and slide rotate when elevation or depression is given to the gun. The hydraulic running out and in cylinders are placed conveniently between the two slide girders, one at either end, and have a single ram working between them, which is secured in a simple manner to the gun cradle. This ram, which is hollow, is provided with a non-return valve at its rear end. When the gun recoils, the water in the rear cylinder is forced first through the non-return valve mentioned, and passes into the front cylinder, the valve being loaded to a working pressure slightly higher than the pressure in the hydraulic main, so that when water under pressure is admitted to the rear cylinder the valve will not open. The ram will, in this condition, be to all intents and purposes solid, and the hydraulic pressure, acting on it will run the gun out after firing. The rear cylinder is, under usual conditions, always open to hydraulic pressure, so that the gun is run out automatically to the firing position. An intercepting valve is fitted on the hydraulic connection, which effectually prevents any pressure generated in the run-out cylinder during recoil from passing into any of the hydraulic connections.

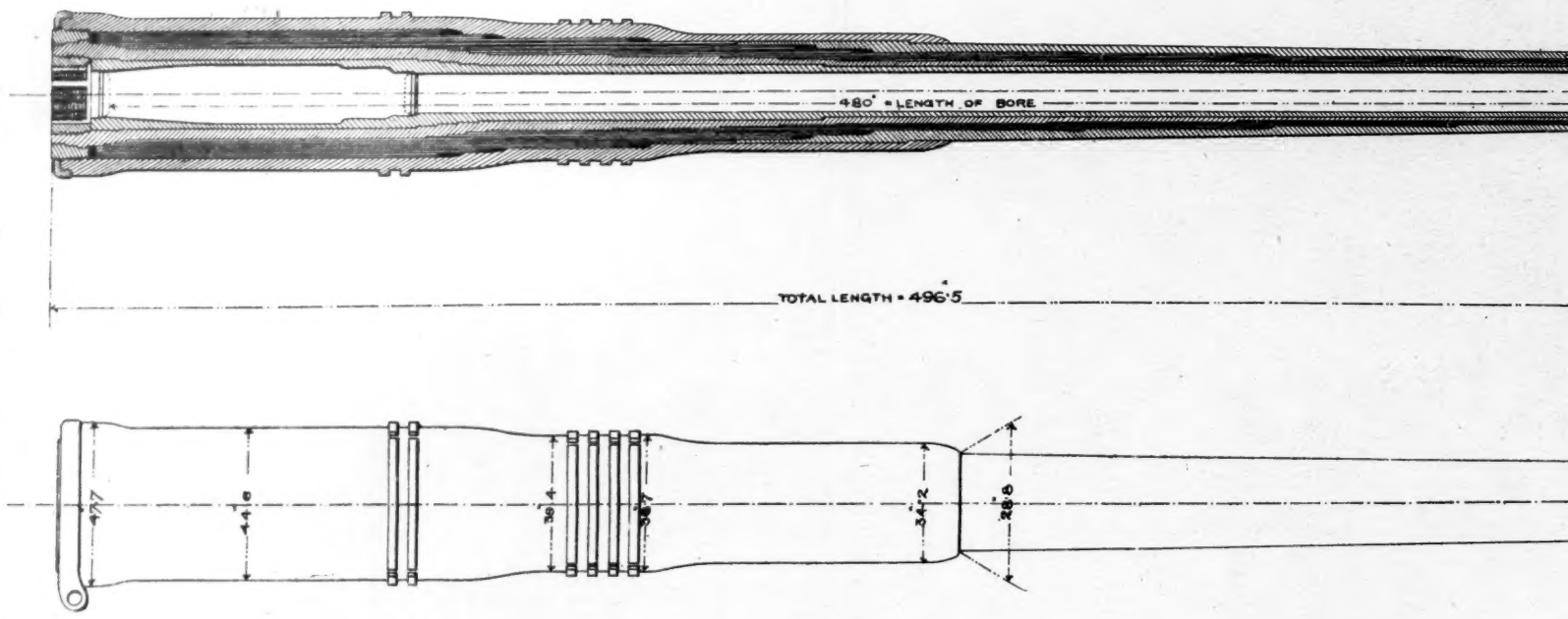
The alternative method for running the gun out after firing is purely mechanical, and consists of a train of gearing connected to racks attached to the gun cradle, worked by hand or by power from the chamber below the gun, a handwheel at the rear of the mounting serving to connect or disconnect the gear from the racks. The usual hand lever for working the gun by hydraulic power is used as an indicator or telegraph to the chamber below, so that the operation on the gun platform is identical whatever method of working the gun is employed. The same system is used with the elevating gear; two toothed arcs attached to the under side of the gun slide are moved by a train of suitable gear worked by hand and by power, also from the chamber below. With this gear, however, an ingenious system of disconnection is used, so that it is not necessary to unclutch or disconnect the arc pinions when working by the usual hydraulic service. This is so arranged that the hand power is always connected up ready for working when the hydraulic pressure is shut off from the elevating presses, but it is automatically released the instant the pressure is turned on.

Automatic sighting gear is provided on the gun mounting, and is arranged in duplicate for each gun.

12 INCH, 40 CALIBRES. B.L. GUN.

SCALE $\frac{1}{48}^{TH}$

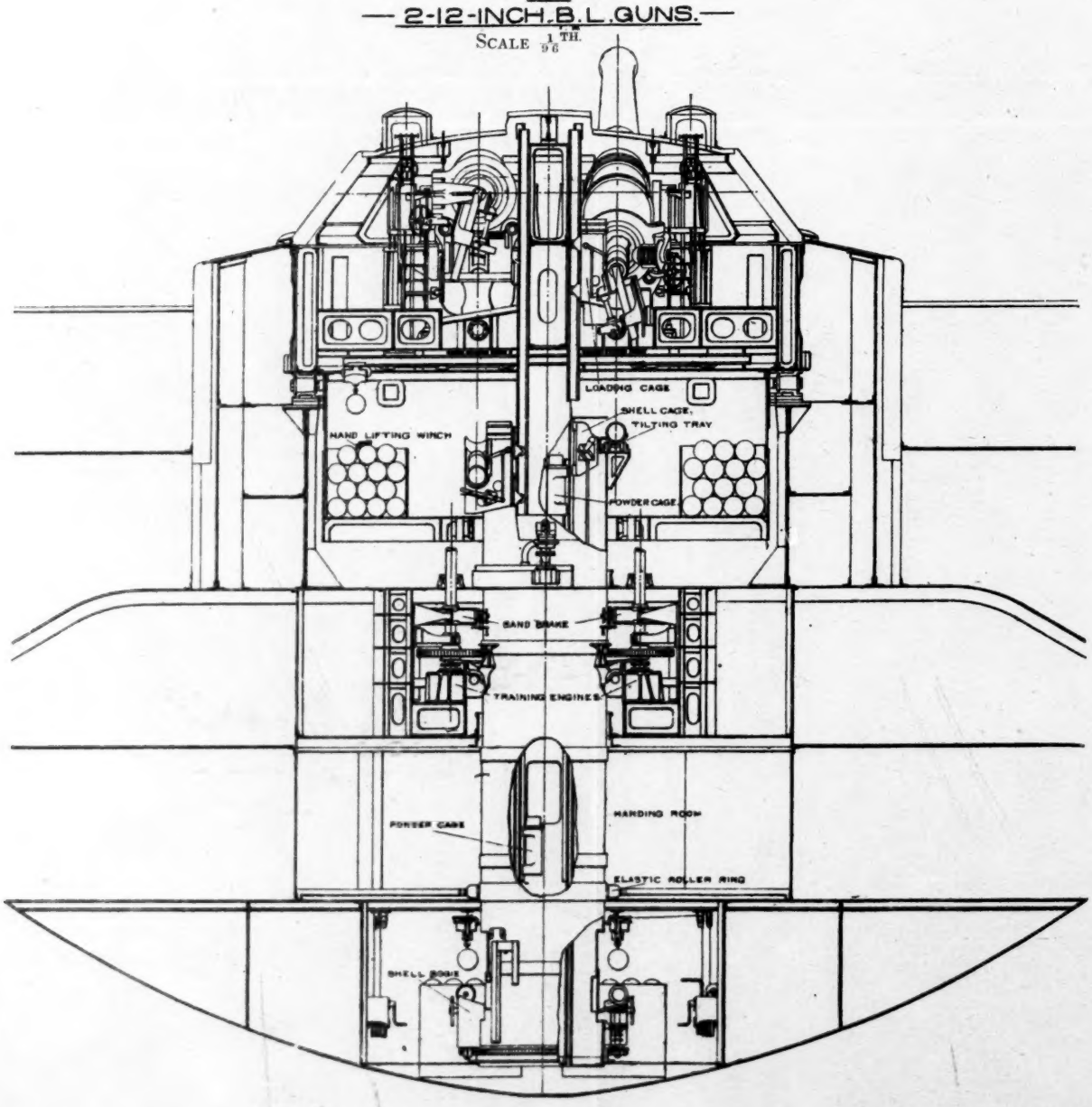
WEIGHT - TONS 50 - CWT 7



CHARGE (CORDITE)	207 LBS
PROJECTILE	850 "
VELOCITY (FEET PER SECOND)	2600
ENERGY (FOOT TONS)	38843

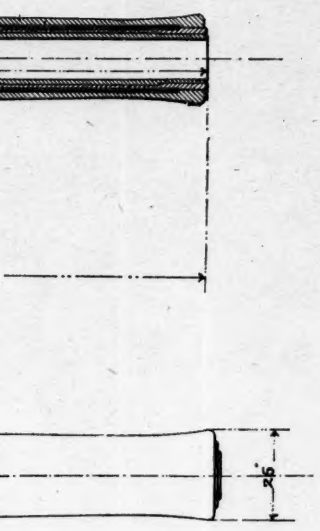
BARBETTE MOUNTING FOR 2-12-INCH B.L. GUNS.

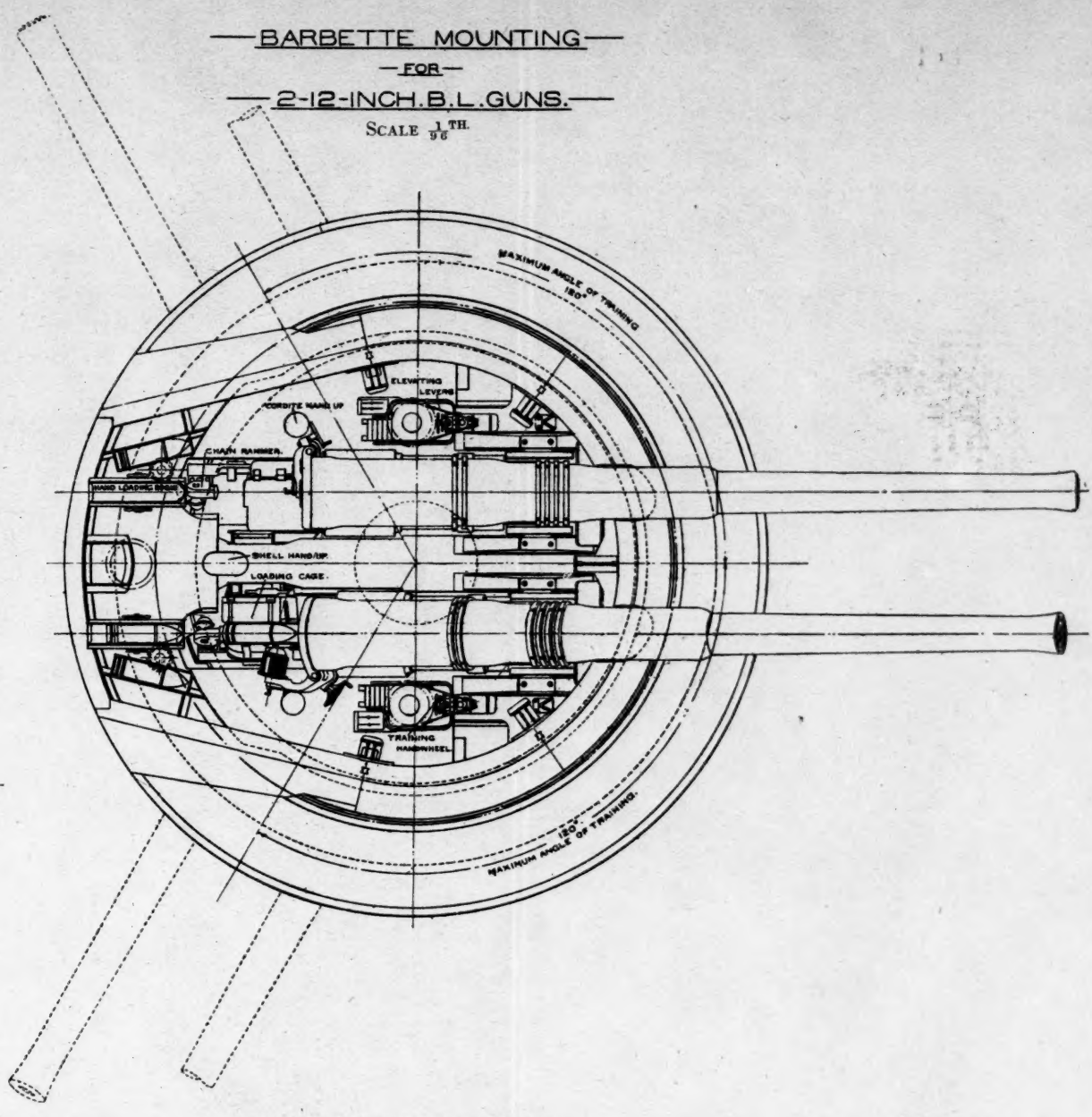
SCALE $\frac{1}{96}^{TH}$



BARBETTE MOUNTING
FOR
2-12-INCH.B.L.GUNS.

SCALE $\frac{1}{96}$TH.





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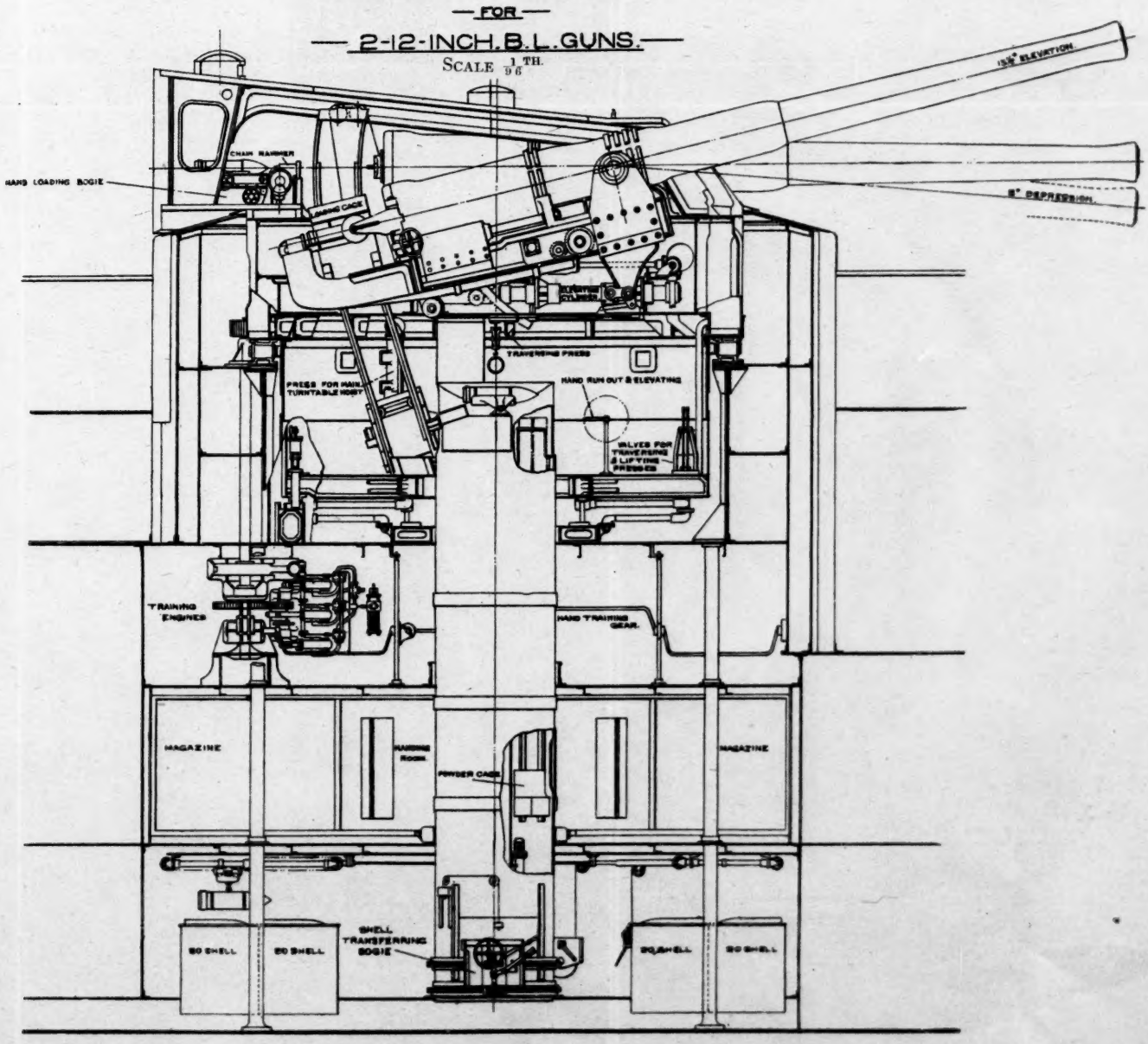
SCALE $\frac{1}{96}$TH.



For loading the gun at any angle of elevation an arm is attached to the rear of the gun slide, and extends sufficiently far to the rear to support the rammer apparatus clear of the recoil of the gun. The apparatus consists of a rammer-head with guiding stem, a chain flexible in one direction only being arranged to work over a sprocket-wheel, with a hydraulic motor, to rotate the sprocket-wheel. This is so arranged that the rammer-head is always in line with the bore of the gun. The chain is guided in a casing fixed to the under side of the slide-girder and works practically without noise. To avoid shock when the rammer is withdrawn a hydraulic buffer serves to cushion the rammer-head and bring it gently to rest. A loading tray provided on a horizontal axis below the breech enters the gun automatically by the assistance of the ammunition cage, and is arranged to withdraw as the cage is lowered. The cage carries the usual service projectile of 850 lbs. in an open tray and a service charge of 212 lbs. of cordite, either in half or quarter charges, in a compartment at one side of the tray and partly above it. The cage moves up and down upon rails leading from a closed chamber below the gun. These rails, within the limits of the gun's angular movements, are concentric with the trunnions, and the cage is consequently, within this limit, always in the same line as the bore. It is arranged to abut against fixed stops on the arm attached to the gun-slide by an ingenious system of simple hydraulic press connections, and when in this position it is always compelled to follow the movement of the gun. It is, moreover, locked in this position by an automatic bolt as soon as the rammer-head begins to move forward, and continues so until the rammer is completely withdrawn. When the cage is in the lower position for charging in the chamber below it is locked to the ship's structure, all slackness of the hoist ropes being completely avoided by the system of hydraulic press that has already been described.

The mounting is enclosed by a shield securely attached to the upper floor of the turntable by suitable plates and angles. The front and sides are sloping and circular in plan. The rear part is extended to provide space for the gun's crew and also serves to balance the mounting. The opening between the shield and the barbette wall is made water-tight by means of a flexible leather apron, which may be adjusted by means of screws.

There are two sighting hoods and one look-out hood at the rear.

ARGENTINE REPUBLIC.—The Budget for 1900 shows a decrease of 1,531,537 pesos (£306,307), as compared with 1899. The principal items are as follows :—

——	1899	1900
	Pesos.	*Pesos.*
Admiralty	371,460	357,720
Permanent War Council ...	47,280	43,200
Harbours and fortifications ...	29,051	30,600
Dockyard	982,584	882,480
Guns	31,135	23,400
Martin Garcia Island... ...	27,180	8,520
Squadron on Rio Negro ...	20,280	22,080
Schools	385,140	270,600
Light-houses	69,540	69,360
Administration and pay ...	4,143,120	3,585,840
Marine prefectures	734,460	515,940
Various expenses	606,800	436,400
Total	7,448,030 (£1,489,606)	6,246,140 (£1,249,228)
(One peso being approximate to 4s.)		

There are also votes of 14,670 pesos (£2,935) for medical services, 5,662,620 pesos (£1,132,524) for new constructions, and for new transport 32,160 pesos (£6,432).—*Mittheilungen aus dem Gebiete des Seewesens.*

The semi-official *Revista Maritima Brazileira* (published under the direction of Vice-Admiral Jaceguay), which pays particular attention to the preparations of Argentina and Chile, states that the naval and military authorities of the former Republic have estimated at 100,000,000 pesos (£25,000,000) the cost of an eventual war with the latter. A scheme of coast defences has been settled, and the necessary works are to be carried out by the Ministry of Public Works, the responsibility for the defence of the littoral being confided to the Navy. At the present time attention is directed to the extraordinary activity which is being displayed in the works of the new naval port of Belgrano at Bahia Blanca. A mole, which will be the largest in South America, is now actually in hand, and will be in two sections of 361 feet and 298 feet, with an extreme breadth of 85 feet. The channel of approach to the outer harbour has a depth of about 21 feet at low tides, and of 30 feet with a mean rise, and the width is 164 feet. There will be accommodation in the harbour for 20 vessels of the "Garibaldi" class, besides torpedo and other basins, a dry dock, engineering shops, electric works, ordnance and other stores, magazines, and every provision for repairing, supplying, and victualling ships. The Government has set apart 900 hectares of land for the works of the port, and there will be barracks for 1,000 men, and exercising space for about 10,000, with a naval school, an astronomical and meteorological observatory, a hospital, and other buildings. A railway line connects Port Belgrano with Punta sin Nombre, where fortifications are being erected to protect the mouth of the Bahia Blanca channel. For a distance of about fifteen miles below the entrance to the channel leading to the port a series of forts and batteries armed with Krupp 10-inch guns and mortars will give protection to the place, and there will be proper provision for the gunners. With the exception of cement, all the materials being used at the port are of Argentine origin, the granite coming from Tandil, the sandstone from Ventana, the lime from Hinojos and Olivarria, and the timber from Tierra del Fuego. The director of the works is Senhor Luis Luiggi.—*Times.*

BRAZIL.—*Organisation of the Brazilian Navy.*—The President of the Republic is invested with the supreme command of the Navy, and is assisted by a minister responsible only to the Chief of the State. The minister does not attend sittings of Congress, and only communicates with the Assembly in writing.

The central administration consists of four bureaux under the orders of the Chief of the General Staff. The Sub-Chief of the Staff is head of the 1st Bureau, which is concerned with the officers, seamen, marines, coast-defence, and naval law business. The 2nd Bureau is the Medical Department. The 3rd Bureau is concerned with the construction of ships and their machinery, etc.; at its head is an engineer officer. The 4th Bureau is that of the Administrative Services, and has at its head the Commissary-General.

The Brazilian Navy has arsenals at Rio de Janeiro, Pernambuco, Bahia, Ladario, and at Itaqui, on the Upper Uruguay, for the keeping in repair of the river flotilla. The arsenal at Rio is the only important one, and its head is the director of the *matériel* of the fleet; he has the superintendence of the building arrangements for new ships, the guns, torpedoes, and hydraulic works; all the workmen are civilians. The head of the Hydrographical Department has charge of the buoying and lighting of the coasts.

There is a High Court of Justice, which is common to both the Army and the Navy, and a Superior Naval Council, which is consulted on questions of organisation, promotion of officers, and to the members of which is delegated the duty of inspecting different branches of the Navy. Moreover, the Navy is represented by two officers on the Superior Council of War, and this committee can be consulted by the Minister of Marine. It may be added that the Superior Council of the Navy is consulted on the questions of armament, but not in regard to the designs of ships; the responsibility for these is left entirely to the Inspector-General of Naval Engineering.

The officers are drawn principally from among the students of the Naval School, who become ensigns after a five years' course of study. In addition, candidates from among the men belonging to both the republican and mercantile navy, with five years' service at sea, and who can pass the required examination in navigation and gunnery, may also be promoted to ensign.

The engineer officers are also drawn from among the pupils of the Naval School; they are put on a special course of study during their fourth year, which is followed by two years' work in the dockyard at Rio de Janeiro. When they reach the grade of sub-engineer they are sent on a three years' mission to foreign dockyards.

The officer-mechanics are recruited from among the pupils of the mechanical schools; these schools also furnish mechanics to the mercantile marine.

The grade of warrant officer is open to young men of over twenty-one years of age, who possess the necessary educational qualification, and who can pass a practical examination before a commission presided over by the Sub-Chief of the Staff. Preference is given to quartermasters and seamen, and, in default of these, to volunteers engaged for three years.

The men of the fleet are recruited among the boys under training, by voluntary enlistment and men compulsorily drawn for service from among the maritime population. They have to serve for nine years on the active list and three years in the reserve. The corps of seamen is commanded by a captain. The boys pass three years in the established schools in each State (except Minas Geraëz and Goyaz); they are entered between the ages of thirteen and fifteen; and 3,000 pupils are under instruction in the different schools.

The artificers, carpenters, sailmakers, etc., have to pass an examination at the dockyard before entry, as have also the paymaster's staff and sick-berth attendants. The marine infantry forms the guard for the dockyard at Rio and furnishes riflemen for the war-ships.

There is a special legal code, which is applied both on board ships and the naval establishments on shore. Courts-martial are composed of seven members, one of whom is a civil magistrate, who acts as reporter to the Court, and has also a deliberative voice. The High Court of Military Justice is a permanent Council of Revision, and is composed of 15 life members—8 military, 4 naval, and 3 civil magistrates.—*Marine Rundschau.*

Steam Trials.—The new torpedo-cruiser "Tamoyo," built at the Germania Yard, Kiel, has completed her steam trials successfully; under forced draught during a four hours' run, the engines developed 7,500-I.H.P., giving a mean speed of 22·7 knots, while during an eight hours' run under natural draught the engines developed 5,000-I.H.P., which gave a mean speed of 20·5 knots. The dimensions of the ship are as follows:—Length, 269 feet; beam, 28 feet 10 inches; draught, 9 feet 10 inches, with a displacement of 1,080 tons. The armament consists of two 10·5-centimetre (3·9-inch) guns, six 5·7-centimetre (2·2-inch), two 1·4-inch machine guns, all Q.F., and 2 mitrailleuses, with three under-water tubes for 18-inch torpedoes. There is an armour deck, 1 inch thick on the slopes and $\frac{3}{8}$ inch on the horizontal part, in addition to protection afforded by the coal bunkers. The bunkers can stow 260 tons, which, at 10 knots speed, give a radius of action of 6,000 miles.

The new small battle-ship "Marechal Deodoro," built by the Société des Forges et Chantiers de la Méditerranée, at La Seyne, near Toulon, has also successfully completed her trials, and has arrived at Rio. She is a formidable little vessel of the following dimensions:—Length, 267 feet 6 inches; beam, 48 feet; displacement, 3,162 tons, with a draught of 13 feet 2 inches. Her engines develop 3,400-I.H.P., giving a speed of 15 knots. Protection is afforded by an all-round water-line belt of 13·5-inch hardened steel, with a 2-inch armour deck; the two turrets for the heavy guns are protected by 8-inch armour, and the case-

mates for the secondary battery by 3 inch. The armament consists of two 9·4-inch (one in each turret), four 4·7-inch Q.F. guns in casemates at each corner of the superstructure, and a couple of 5·9-inch mortors or howitzers. There are also ten 3- and 1-pounders distributed over the spar-deck, tops, etc., with two submerged tubes for 18-inch torpedoes. At her four hours' official trial a mean speed of 14·9 knots was attained. The trials of her submerged torpedo-tubes, which are of the latest Elswick pattern, were also satisfactory.—*Le Yacht.*

FRANCE.—The following are the principal promotions and appointments which have been made: Vice-Admirals—C. E. De La Jaille to be President of the Committee of Inspectors-General of the Navy; O. Gigault de la Bédollière to be Commander-in-Chief and Maritime Prefect of the 3rd Arrondissement (Lorient); C. De la Bonninière de Beaumont to be Commander-in-Chief and Maritime Prefect of the 5th Arrondissement (Toulon). Capitaine de Vaisseau—J. J. G. De Percin to "Guichen." Capitaines de Frégate—F. G. Rabouin, P. P. Donin de Rozière, to be Capitaines de Vaisseau; L. C. Martel to "Kersaint."—*Le Journal Officiel de la République Française.*

General.—The new first-class cruiser "Guichen" has not yet joined the Squadron of the North, as she has had to go into the dockyard hands at Brest to make good some defects which have developed in consequence of her heavy rolling when subjected to a long Atlantic swell while on her passage round from Toulon; she made the passage from Toulon to Brest in four days, averaging from 18 to 19 knots the whole way. In outward appearance she somewhat resembles a mail steamer; has four funnels and three pole-masts; in spite of her 8,000 tons displacement, her armament is excessively weak, consisting only of two 6·4-inch Q.F. guns and six 5·5-inch Q.F. guns, with ten 3-pounders; before leaving Toulon a third mast amidships was added, and her furnaces altered to allow of her burning petroleum fuel in addition to coal.

The second-class battle-ship "Dévastation" has not yet commenced the changing of her boilers, although her new water-tube Bellevilles have arrived at the dockyard at Brest; there will be a saving of weight effected by the changes in the ship of something like 200 tons, which ought to be utilised to increase her coal supply; her new armament, the composition of which has been several times altered, has now been definitely fixed as follows:—In the redoubt, four 27·4-centimetre (10·8-inch) guns of the 1893 model, in place of the four 32-centimetre (12·6-inch) old guns now mounted; on deck the three 27·4-centimetre guns mounted, one abaft and one on each beam, will be replaced by three 24-centimetre (9·4-inch) guns of the latest type, with screens, while the 24-centimetre gun forward will be replaced by a 10-centimetre (3·9-inch) Q.F. gun.

The submarine boat "Morse," after what are considered a series of very successful trials at Cherbourg, has been accepted by the naval authorities; she will be sent for a cruise soon to visit different places along the coast; she is supposed to have a radius of action of 100 miles. On her last full-speed trial she made 12·3 knots, a notable improvement on the "Gustave Zédé," which has never attained a higher speed than 8 knots. The new submarine boat "Narval" has been trying at Cherbourg her torpedo-discharges, which are on the Drzewiechi system, with, on the whole, satisfactory results. The new torpedo-boat destroyer "La Hire" has been carrying out some supplementary trials; she is fitted with the Norman-Sigaudy water-tube boilers, it being claimed for these boilers that they are very light, easily managed, and quite safe, owing to the small amount of water which passes through the tubes, while the pressure can be very rapidly increased or diminished as required; these boilers have been fitted to the first-class cruisers "Chateaurenault" and "Jeanne d'Arc," and the weight gained by their lightness has notably increased the amount of coal these ships are able to carry.

The old battle-ships "Victorieuse," "Colbert," "Trident," and "Richelieu" have, by order of the Minister of Marine, been struck off the effective list of the fleet. It was believed that two at least of these vessels would have been sent to Bizerta, pending the construction of regular fortifications, where, moored behind the moles, their numerous guns would have been an important factor in the defence of the place; in fact, Captain Merleaux-Ponty, the commandant at Bizerta, made a short time ago a formal application for the services of two of these ships, but it seems now as if the authorities had determined not to utilise them for this purpose, and the work of dismantling them has commenced. It is proposed to form a new depôt for coal and supplies at Marseilles, and the rear-admiral in command of the port has been called upon to furnish the necessary proposals for this end to the Minister of Marine.

The following are the probable movements of ships during the current quarter:—

Cherbourg.—The new torpedo-destroyers "Pique" and "Fauconneau" will commission in April for their trials.

Brest.—The special-service vessel "Chimère" commissions in April for home hydrographic service. The first-class cruiser "Guichen" will complete to her full effective and join the Squadron of the North.

Lorient.—The second-class cruiser "Isly" commissioned on the 5th inst. for service on the Newfoundland and Iceland fisheries; the new first-class gun-boat "Décidée," after completion of her trials, commissions to relieve the "Lion" in China and the East Pacific; the torpedo-destroyer "Framée," after completion of her trials, will commission for service with the Mediterranean Squadron.

Rochefort.—The new first-class gun-boat "Zélée" will commission during April for her trials, and the third-class cruiser "Infernet" will also commission for a destination not stated.

Toulon.—The torpedo-aviso "Casabianca" will commission in June with *effectif de disponibilité*, and will be attached to the *Défense Mobile* at Bizerta. The torpedo-aviso "Lévrier" will commission in June with *effectif de disponibilité* for service with the *Défense Mobile* at Corsica.

The Squadron of the North.—The ships completed to full sea-going strength for six months on the 2nd inst.

East Indies.—The transport-aviso "Pourvoyer" will probably be paid off at Madagascar, and will be relieved by the aviso-transport "Nièvre."

The Torpedo School.—The Chamber has refused to sanction the necessary credit for fitting out the "Ving-Long" as a torpedo-school-ship; the school is at present completely disorganised, part being on board the "Marceau," part on shore, and another section serving with the different *Défenses Mobiles*. Great complaints are being made about the present position of the school, and it is felt to be absolutely necessary that as soon as possible it should be put again on a proper footing, under a special commandant and special instructing staff as formerly.

By a recent decree, Port Pothuau, situated in the western part of Hyères roads, with its harbour works and quays and lighthouses, has been placed under the control of the department of the Minister of Marine.

The report of the commission of the Chamber charged with the examination of the *projet de loi* for the defence of the colonies proposes an increase of the original estimate of 45,000,000 francs (see Notes in February JOURNAL) to 61,275,000 francs to be apportioned as follows:—

	Francs	
Colonial fortresses	45,000,000	(£1,800,000)
Mobilisation stores	2,900,000	(£116,000)
Provision of artillery, stores, and munitions for the *points d'appui* and *réunion*	3,375,000	(£135,000)
	51,275,000	(£2,051,000)

The late Vice-Admiral Baron Duperré.—The death is announced at the age of 75 of Vice-Admiral Baron Duperré, generally known as Admiral Victor to the French Navy, to distinguish him from his cousin, Admiral Charles. He was born in 1825, and entered the Naval School in 1840. As a lieutenant he greatly distinguished himself at the bombardment of Sweaborg in 1855, and being considered too young for promotion to commander, he received the cross of officer in the Legion of Honour for his services. After this his advance was rapid, and he became Capitaine de Vaisseau at the age of 40, Rear-Admiral at 47, and Vice-Admiral at the age of 54. His reputation was great as an organiser and administrator, and he held the appointment of chief of the staff to various Ministers of Marine up to 1874 ; in this year he was appointed Governor of Cochin-China, returning to France in 1877, after having given further proof of his ability. He subsequently commanded the 1st Division of the Evolutionary Squadron, and was in succession Maritime Prefect of Toulon, Commander-in-Chief of the Mediterranean Fleet, and Vice-President of the Admiralty Council, which appointment he held till the date of his retirement for age in 1890. His views were very conservative, and he latterly lost some of his influence by his opposition to reforms. —*Le Temps*, *Le Yacht*, and *Le Moniteur de la Flotte*.

New River Gun-boats.—Last month there was launched from the yard of Messrs. J. I. Thornycroft & Co., at Chiswick, a little war-vessel which possesses perhaps more than ordinary interest at the present time. The vessel in question, the "Argus," is one of two sister craft which are being constructed to the order of the French Government. She is a river gun-boat, 145 feet long, 24 feet wide, and will have a displacement of 123 tons. The speed is to be 13 knots, and this is to be obtained on a maximum draught of water of no more than 2 feet. The "Argus" and her sister vessel, the "Vigilante," also soon to be completed, will be propelled by twin screws having compound engines, the aggregate power of which will be 550-I.H.P. Steam is generated by two Thornycroft water-tube boilers. The machinery for each screw will be placed in separate water-tight compartments. The speed to be obtained on so light a draught of water is the most notable characteristic of the boats ; but this is a feature in which British builders, the Thames firms especially, have been giving some remarkable instances of late. In the case of these two vessels it is made possible by the use of the Thornycroft screw-turbine propeller, an ingenious device which, by means of specially-arranged guide-blades, causes the screw race to be projected more directly astern. For this reason a propeller much smaller in diameter than that which would be needed were the ordinary screw used, can be adopted for any given rate of steaming. The designers of the vessel have, however, gone beyond this, and so arranged that part of the propeller is actually above the normal water-line. It need hardly be said that a screw not fully immersed is a most inefficient propeller, and in order to get the screws of these boats wholly in the water they are placed beneath the after part of the vessel, the bottom plating being arched up for the purpose. The propeller, therefore, revolves beneath and partly within the hollow of a kind of elongated flat dome, which may be roughly compared to the inverted bowl or an enormous tablespoon. The edges of the dome naturally dip beneath the water surface, but the crown is well above it. When the propellers begin to revolve water is driven astern, and at the same time it rises within the dome, or tunnel, as it is called, thus driving the air out. The tunnel once filled with water is kept full by the pressure of the atmosphere on the surface of the surrounding water. This is in accordance with well-known natural laws, which prevent the formation of a vacuum in the tunnel such as would be caused by the subsidence of the water therein.

The battery deck of the "Argus" is surrounded for a depth of 3 feet by special bullet-proof steel plates $\frac{5}{16}$ inch thick. The deck houses are covered by the same description of armour, which is loop-holed for rifle fire. The whole of the engine and boiler spaces are also protected by bullet-proof steel plates. Cabin

accommodation is provided for the commander, two officers, and eight engineers and petty officers. The total complement of officers and crew is 30. The men are berthed on the upper deck, hammocks being slung under the fixed awning, which surmounts the whole. This will afford accommodation in warm weather, but a new departure in these shallow-bodied light-draught boats is introduced in utilising the hull proper for cabin purposes for the men. As the quarters will be somewhat cramped below deck owing to small head room, this accommodation is doubtless for cold weather. A great deal of difficulty is experienced in steering these flat-bottomed shallow-draught boats. As every inch of draught must be utilised, no vertical keel or dead-wood is possible, and in order to prevent the boats from making excessive leeway there have been fitted a couple of lee-boards similar to those used on ordinary Thames sailing barges. These when lowered, will naturally add considerably to the water the vessel will draw, but doubtless the 2 feet maximum is an emergency draught, necessary only for passing occasional shallow places. The lee-boards will, of course, be also useful for preventing the vessel from blowing off before the wind when the engines are stopped. They are placed well forward at about the distance from the bow at which the boat would pivot when the turning movement was well established, and this will add very materially to the manœuvring properties of the vessel. The hull is built in 11 separate floatable sections, so that it can be divided up for the purpose of transportation. There is a conning-tower forward in which is a wheel, there being another steering station in the upper deck-house. Both hand and steam steering is provided. There is a search-light forward, and two boats are carried. The armament is powerful for a vessel of this kind. It consists of two 90-millimetre guns and four 37-millimetre guns.—*Times.*

UNITED STATES.—*Annual Report of Chief of Naval Ordnance.*—The annual report of Admiral O'Neil, Chief of Naval Ordnance, presents the following estimates:—6,503,124 dollars (£1,354,817 10s.) for the year; 250,000 dollars (£52,083 6s.) of this is for reserve guns for auxiliary cruisers, 4,000,000 dollars (£833,333 6s.) toward armament for vessels authorised, 6,000 dollars (£1,250) for naval militiamen, 100,000 dollars (£20,833 6s.) for improvement at naval magazine, Dover, N. J. Of the 939 main battery guns authorised, 756 are complete and 751 have been assigned, 13 are partly completed, and the forgings for 174 have been ordered. In addition, we have twelve 6-inch and eight 4·7-inch guns purchased with the "New Orleans" and "Albany." Including these there is a gain of 189 guns over last year. There are no 12-inch 40-calibre guns yet ready, and only one has gone beyond the forgings ordered. For the 5-inch 50-calibre the forgings have been ordered, but no guns are ready or in process of manufacture.

Sixty-three guns have been completed since last report; 17 have been assembled, and are well advanced, and 28 have been converted to rapid-firing.

New Guns.—The new model guns have enlarged powder chambers, and are of the following lengths, viz., 10 and 12-inch 40-calibre; 8-inch 45-calibre; 3, 4, 5, and 6-inch 50-calibre. The first of the new 4-inch guns, with its mount, has been completed and tested. The gun exhibited excellent ballistic properties, a muzzle velocity of 2,991 foot-seconds having been recorded within the limits of chamber pressure for which the gun was designed (viz., 17 tons per square inch), using Navy smokeless powder not especially manufactured for this type of gun. It is expected that still better results will be obtained when the exact size of grain is determined for the powder. The first of the new 6-inch guns, with its mount, is nearly completed, and will soon be tested, and the first of the new 12-inch guns is assembled and in an advanced state. Two 8-inch nickel-steel guns have been assembled. One of them is to be fitted with a Q.F. breech mechanism of new type, designed by Lieutenant F. J. Haeseler, U.S.N., a similar mechanism fitted to a 4-inch gun having given good results. The satisfactory performance of the new

4-inch gun, which is made on the same design as regards chamber as the larger calibres, justifies the Bureau in anticipating equally good results from the latter. The gun steel delivered by the manufacturers has been of excellent quality, and but very few forgings have been rejected. The process of gun manufacture is rapidly and accurately carried on at the Naval Gun Factory, due to excellent machinery, new and good mechanical devices, and to the intelligence and skill of the operatives. The new guns will be fitted with the "Wellin screw" or breech plug, which gives a proportionately larger threaded area than the plugs now in service, and therefore admits of a shorter and lighter plug, which is a matter of considerable importance, especially in the larger calibres. A new type of breech mechanism has been adopted for the 6-inch and 5-inch R.F. guns of 50 calibres, which possesses several admirable features. It has great power to unlock, has a combination electric and percussion firing attachment, and an automatic ejection of the primer. These guns will not require brass cartridge cases.

A 14-pounder (3-inch) R.F. gun is completed, and the mount nearly ready, and both will soon be tested. This is a new type of gun so far as the Navy is concerned, and is intended for part of the armament of the new destroyers, and probably will form an important part of the secondary battery of future battleships and large cruisers. It is designed for 3,000 foot-seconds muzzle velocity, and, therefore, should have great range and a flat trajectory. Its remaining velocity of 3,000 yards should be 1,400 foot-seconds, which would give it a penetrating power of 1·52 inches of Harveyized steel, or 1·22 inches of Krupp armour at that distance, rendering it a destructive weapon against the unarmoured portions and exposed gun positions of an enemy's vessels.

All the new guns are being fitted for a telescope sight, and for a bar sight for day and night use, designed by Lieutenant H. D. Tisdale, U.S.N., an officer on duty at the gun factory, who has also been largely instrumental in improving the pedestal mounts above referred to.

New Mountings.—The work on gun mounts has progressed simultaneously with the guns. The turret mounts of the four new harbour-defence monitors will have the same general characteristics as those for the "Alabama" and "Maine" class, but the construction has been improved in several important details. The first mount is well under way. A new type of 6-inch mount for the 6-inch gun of 50 calibres has been designed, and is nearly completed and will soon be tested. A new type of mount for the 4-inch 50-calibre gun has been designed, manufactured, and tested, with satisfactory results.

Experience has shown that the pedestal mounts as heretofore made for 4, 5, and 6-inch guns can be greatly improved, and such improvements are now being applied to those for the vessels of the "Kearsarge" and "Alabama" class, and will be adapted to all others as funds and opportunity permit. The alterations consist in the substitution of a steel for a bronze oscillating slide and improved training and elevating gear, both fitted with friction brakes, and also of a change in the rollers giving greater ease of trains.

Ammunition Hoists and Magazines.—New and improved ammunition hoists have been designed and manufactured for the 8-inch turrets of the "New York" and "Indiana," and similar hoists are in an advanced state for the "Oregon," "Olympia," and "Massachusetts." Hydro-pneumatic rammers have been manufactured and installed on board the "Oregon," "Massachusetts," and "Indiana" in place of the former hydraulic rammers, which were constantly giving out, and others are now in an advanced state for the older monitors, which are now supplied with hydraulic rammers. All the later ships are to be supplied with the chain rammer, which can be operated by hand or electric power.

The question of a means of reducing the temperature of magazines on board ship by connecting them with the refrigerating plant is now under consideration, and preliminary steps have been taken to introduce such a feature on the battleships now being built. Special attention is being given in connection with the

Bureau of Construction and Repair, to providing good means of ventilation for turrets—a matter that the recent war showed was most important.

Armaments of Ships.—The batteries for the "Kearsarge" and "Kentucky," with their accessories, have been completed, with the exception of the 5-inch guns and top carriages, which will be completed by the time the vessels are finished. The 13-inch guns of the "Alabama" and the turret fittings have been completed. The 6-inch guns are completed, and their mounts will be ready in about two months. The 13-inch guns and mounts for the "Wisconsin" are completed. The 6-inch guns are completed, and their mounts and will be ready in about three months. The 13-inch guns and mounts for the "Illinois" are completed. The 6-inch guns and mounts will be completed in about four months. The entire ordnance outfit for all the above vessels will be ready in advance of the completion of the ships. A battery has been completed for the training-ship "Chesapeake."

All the above vessels will receive entire outfits of smokeless powder.

The guns for the battle-ships "Maine," "Ohio," and "Missouri" and the four harbour-defence monitors are under way, and they will be completed far in advance of the vessels, as will the armament of the "Denver" class. The launching tubes for all new destroyers and torpedo-boats are completed, and their batteries will be ready in time.

The main battery of the battle-ships "Maine," "Ohio," and "Missouri" will consist of four 12-inch guns of 40 calibres and of sixteen 6-inch R.F. guns of 50 calibres.

The new monitors "Arkansas," "Florida," "Wyoming," and "Connecticut" will each carry two 12-inch 40-calibre guns and four 4-inch 50-calibre guns, with shields. The six cruisers of the "Denver" class will each carry ten 5-inch guns of 50 calibres.

The development of the 12-inch gun has been so great that its adoption for recent vessels, rather than the 13-inch guns on the older vessels, became a logical sequence. It has a projectile of about 850 lbs. weight, as against 1,100 lbs. for the 13-inch gun, but the muzzle velocity will not be less than 2,800 foot-seconds, against 2,300 foot-seconds. The muzzle energy will therefore be 58,221 foot-tons, as against 40,404 foot-tons for the 13-inch gun; penetrating power at 3,000 yards 17·92 inches of Harveyized nickel-steel armour, as against 15·91 inches. The racking and battering effect will be less. The new 12-inch gun will readily perforate any armour afloat or likely to be put afloat, and the Bureau considers it a more suitable weapon for the new battle-ships than a gun of larger calibre.

The 6-inch R.F. 50-calibre gun for the new vessels will have a muzzle velocity exceeding 2,900 foot-seconds, with a muzzle energy of not less than 5,838 foot-tons. At 3,000 yards they will have the power to penetrate Harveyized nickel-steel armour of 5·3 inches in thickness, and they have a proving ground record of ten rounds per minute.

The new 5-inch gun for the "Denver" class and the 4-inch for the monitors will be of 50 calibres, and capable of developing a muzzle velocity of 3,000 foot-seconds.

Colt Guns.—There are in service a considerable number of 6-millimetre automatic Colt guns, which, in general, have given good satisfaction. When they have failed it has almost invariably been due to neglect of some necessary precaution. Great accuracy is required in filling the belts; the parts move with great rapidity, and the barrel becomes very hot after a short time, rendering it difficult to adjust any derangement which may occur. The Bureau has ordered a 0·30-calibre Colt automatic to handle the Army cartridge, for test and experiment. A 0·30-calibre Gatling, to handle the Army cartridge, has also been ordered. The Bureau is of the opinion that it will be found expedient to supply each vessel with a number of automatic guns of small-arm calibre, according to her class, and one hand-working gun. Under such conditions vessels will be in this respect well

equipped for any service. A new type of fully automatic 3-pounder gun has been tried with promising results. Such a gun has a rate of possible fire at 70 per minute, as compared with 40 for the semi-automatic gun. It has also the advantage of having four shots in immediate readiness. This device can also be attached to the 6-pounder semi-automatic gun, and the Bureau is having one so fitted for experiment.

Uniform Calibre of Small Arms.—The Bureau is of the opinion that public policy demands the use of a uniform calibre and standard cartridge for both Services. Some experiments have been carried on by the Army with a 0·30-calibre cartridge having a cannelured case, but its adoption at the present time is out of the question, as the Army guns are widely distributed, and the alteration required can only be made at an arsenal. The Army could not change its small-arm equipment even if it desired to; therefore the Bureau considers that the logical solution of the case is for the Navy to at once adopt the Army calibre of 0·30 rifle, and its standard ammunition in so far as applies to additional rifles procured for the Navy. A number of additional rifles will soon be required for the Navy, and after consultation with the Department the Bureau intends to supply itself with the present standard Army rifle to meet these requirements, rather than to go through the long and tedious process of competitive test of new guns. At a later period, should it be determined by the Army to change its type of gun, a joint board of Army and Navy officers might with propriety be ordered to consider the matter. No matter when the change is made by the Navy to the Army calibre, there will be a period during which two calibres will be in use, which will be attended with some inconvenience.

Armour.—The armour situation at present is as follows:—The contracts for the "Kearsarge" and "Kentucky" have been completed. Armour is now being manufactured for the battle-ships "Alabama," "Illinois," and "Wisconsin." There remain to be delivered for these vessels, 832 tons for the "Alabama," 1,255 tons for the "Illinois," and 394 tons for the "Wisconsin"—a total of 2,481 tons. Of this amount about 1,000 tons will probably be delivered during the next six weeks. The armour contracts for these vessels will be completed early this year.

The delay in contracting for the armour for these vessels was due to the fact that Congress had limited the price.

By January, 1900, the contracts were to be made for the armour for the three vessels of the "Maine" class. Such armour as can probably be procured for $400 per ton is not the best armour that can be made, and hence is not suitable for the vessels in question. The Bureau urges that the matter be laid before Congress as soon as it assembles.

The question of a Government armour factory should have no bearing upon the supply of armour for the "Maine," "Ohio," and "Missouri," as it would under any circumstances be impracticable to obtain it from such a source in time to complete the vessels above referred to. No detriment or inconvenience to the Government or its interests has been caused by this delay; but, as previously stated, armour for the above vessels should be contracted for by January, 1900. If, after a further presentation of the case, Congress decides to adhere to the present limitation, the Department will probably be obliged to procure armour similar to that heretofore and now being used, but will have the consciousness of having performed its duty in the matter, and will be free from further responsibility. It is quite evident that the building of armoured ships of war must soon be discontinued by this Government until the vexed questions of the source of supply and the cost of armour are disposed of.

Gun Factory.—Notwithstanding the improvements, the facilities of the gun factory are inadequate to meet the pressing demands of the Service, and it is imperative that further extensions and additions be made.

During the year, 161 guns of various calibres have been proved. No weakness or defect has been observed in any of them, though usually subjected to pressures much higher than obtained in service. Numerous tests of armour plate for vessels now building have been made. Armour-piercing and common shell, representing numerous lots of all calibres, have been tested, with, in most instances, satisfactory results.

Owing to the number of purchased vessels added to the Navy during the recent war, the supply of reserve guns has been considerably depleted, and a further appropriation for them is asked. At the Naval Gun Factory, at the Washington Navy Yard, 113 enlisted men have been under instruction, and 80 at the torpedo station.

Powder.—The Bureau discontinued the purchase of brown powder as soon as the late war with Spain was over, and having a good supply on hand, which can gradually be used up for target practice, directed the powder manufacturers to give their attention entirely to the production of smokeless powder of Navy standard, known as pyro-cellulose. It is most gratifying to the Bureau to be able to report that thus far no unfavourable qualities have been detected in this powder when properly made. Its ballistic properties and keeping qualities appear to be excellent, and to remain unimpaired even when subjected to excessive temperatures of heat and cold and to extreme degrees of moisture. No dangerous pressures are recorded, nor have any of abnormal character been observed in well-made powder of this kind. The question as to the best mode of ignition is now receiving considerable attention. The Bureau has decided, as a precaution to be observed for a year or two, to fix rather small charges; this not only for the purpose of observation and safety, but that the guns may not suffer unduly from erosion, though the latter thus far is almost an unknown condition, which seems to be one of the very good qualities of the Navy smokeless powder, as compared with cordite aad other powders containing nitro-glycerine.

The uniformity of Navy smokeless powder depends largely upon the rate and thoroughness of drying and upon the amount of solvent remaining in it when used. The specifications are, however, very explicit in this respect, and are fully understood by the manafacturers. The drying requires usually from four to six weeks, and where large quantities are turned out daily, the question of drying becomes a serious one, particularly so on account of the risk in case of fire, as a large amount of capital is kept in a precarious state pending the acceptance of the manufactured article. It is not unlikely that by processes other than those now followed quicker drying can be effected.

Researches of an important character have been made as to the materials used, the methods employed, and the tests to be applied in connection with the manufacture of smokeless powder, which are given at length in the report of the officer in charge. One important improvement is the simplification of the process of the manufacture of pyro-cellulose by the omission of the hot water around the crocks and the bringing together of the initial and the final temperatures, so that the rise of temperature during the nitrating is due entirely to the heat of the re-action, and is the same throughout the entire mass. Interesting and valuable experiments with nitrating centrifugals have been carried on, which will be of great use in connection with the smokeless powder factory.

A small-arm smokeless powder has been developed at the station which is believed to equal in quality the best made elsewhere. This has been a long and tedious process, often attended with discouragement and disappointment, but persistent efforts have finally been rewarded. The smokeless powder factory at the station has been steadily employed in the manufacture of powder for minor rapid-firing guns, its product being of excellent quality.

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR MARCH, 1900.

Lieut.-Colonel H. V. Cowan, A.D.C., to be Assistant Military Secretary to Field-Marshal the Rt. Hon. F. S., Lord Roberts, K.P., G.C.B., G.C.S.I., G.C.I.E., V.C., Commanding-in-Chief in South Africa. Brevet Colonel W. F. D. Cochrane, C.B., from Lieut.-Colonel h.p. to be A.A.G., and to have the substantive rank of Colonel in the Army. Major-General A. G. Handcock, C.B., to be Lieut.-General. Colonel C. F. Hughes, C.B., to be Major-General. Lieut.-Colonel W. H. Riddell, Bedfordshire Regiment, to be Colonel. Colonel Sir W. G. Nicholson, K.C.B., is granted the local rank of Major-General whilst employed as Military Secretary to Field-Marshal the Rt. Hon. F. S., Lord Roberts, K.P., G.C.B., G.C.S.I., G.C.I.E., V.C., Commanding-in-Chief in South Africa. Colonel H. H. Settle, C.B., D.S.O., is granted the temporary rank of Brigadier-General whilst Inspector-General of Lines of Communication in South Africa. Brevet Colonel C. F. A. Turnbull from Lieut.-Colonel h.p. to be Colonel to command the 32nd Regimental District (the Duke of Cornwall's Light Infantry). Colonel J. L. C. St. Clair to be Deputy Judge-Advocate-General in South Africa. Colonel Sir F. R. Wingate, K.C.M.G., C.B., D.S.O., A.D.C. to the Queen, having been appointed Sirdar of the Egyptian Army, is granted the local rank of Major-General whilst so employed. Lieut.-Colonel H. H. R. Heath, I.S.C., to be Colonel. Colonel E. S. Browne, V.C., from the 24th Regimental District (the South Wales Borderers), to be an A.A.G. Lieut.-Colonel G. D. F. Sulivan, 4th Dragoon Guards, to be Colonel. Lieut.-Colonel C. Crutchley is granted the temporary rank of Colonel whilst temporarily holding the appointment of A.A.G. for Recruiting at Head Quarters. Colonel D. F. Lewis, C.B., employed with the Egyptian Army, to be extra A.D.C. to the Queen. Brevet Colonel H. W. Trench from Lieut.-Colonel h.p. to be Colonel to command the 100th Regimental District (the Prince of Wales's Leinster Regiment, Royal Canadians). Colonel M. W. Willson, C.B., from h.p. to be Major-General. Brevet Colonel R. Purdy from Lieut.-Colonel Royal Artillery to be a Colonel on the Staff for Royal Artillery in India, with the temporary rank of Brigadier-General whilst so employed, and to have the substantive rank of Colonel in the Army. Major-General (temporary Lieut.-General) Sir H. M. Leslie Rundle, K.C.B., C.M.G., D.S.O., is granted the local rank of Lieut.-General whilst commanding the 8th Division South African Field Force. Lieut.-Colonel E. D. F. Bignell, I.S.C., to be Colonel. To command battalions of Imperial Yeomanry:—Lieut.-Colonel and Brevet Colonel R. K. Parke from h.p.; Lieut.-Colonel and Brevet Colonel H. Paget, C.B.; Brevet Colonel C. S. Gordon from Lieut.-Colonel h.p. to be a Colonel to command the 5th (the Northumberland Fusiliers) and the 68th (the Durham Light Infantry) Regimental Districts. Major-General A. E. Turner, C.B., Royal Artillery, to be Inspector-General of Auxiliary Forces at Head Quarters. Lieut.-Colonel and Brevet Colonel H. A. MacDonald, C.B., D.S.O., A.D.C. to the Queen, to be a Major-General on the Staff to command the 3rd Brigade, South African Field Force, with the local rank of Major-General whilst so employed, and to have the substantive rank of Colonel in the Army. Lieut.-Colonel E. M. Baker from h.p. R.A. to be an A.A.G. Lieut.-Colonel W. H. Daniel, Reserve of Officers, to be a D.A.A.G. The under-mentioned officers to be Colonels:—Lieut.-Colonel A. G. Hipwell, A.S.C.; Lieut.-Colonel R. G. W. Hepburne, R.F.A.; Lieut.-Colonel J. Stacpole, D.A.A.G., Southern District. Lieut.-Colonel E. A. Young, I.S.C., is granted the substantive rank of Colonel in the Army.

HOME.—The annual report on the musketry training of the Regular forces serving at home, the Militia, Yeomanry Cavalry, and Volunteers, during the year 1899, has just been issued. Of the Regular forces, 52,612 trained men and 20,380 recruits were exercised, of whom 42,969 trained men and 16,313 recruits belonged to the infantry. The average regimental figure of merit in the cavalry was 77 (an aggregate) for the compulsory individual firing, and 34 (a percentage) for the compulsory collective practices. The average battalion figure of merit in the infantry was 90 (an aggregate) for the individual, and 50 (a percentage) for the collective. The results generally are regarded as "Very satisfactory." As regards the Militia, the report states that no real progress in musketry can be expected from this force whilst the time allowed for the training is so short and the amount of work expected from the Militiaman in that short time is so extensive.

The present average battalion figure of merit, 38 for individual and 37 for collective, is only regarded as fairly satisfactory. In the case of the Yeomanry the results are classed as "satisfactory," the Commandant of the School of Musketry adding that, from a musketry standpoint, he would like to see the whole force turned into mounted infantry and armed with the rifle instead of the carbine. Among the Volunteers trained, 37,266, or 26 per cent., were classified as marksmen, 20,780, or 15 per cent., as first-class shots, 79,526, or 59 per cent., as second-class shots, and 219, or below 1 per cent., remained in the third class. No detailed remarks on the training of the Volunteers during the past year are submitted, owing to the extensive changes which are to be introduced next season, and which include the doubling of the 21 rounds which are now compulsory. A great improvement in the musketry efficiency of the Volunteers is anticipated from these changes, and it is believed that Volunteer commanding officers will have no difficulty in meeting the additional requirements of Government. Considerable emphasis is laid on the benefit likely to accrue from the new system coming into force this year, by which non-commissioned officers of Militia and Volunteers, other than permanent staff, are to be allowed to go through courses at the Hythe School of Musketry. In relation to field firing, a special note is added to the effect that great credit is due to many Volunteer battalions for the time and trouble expended by them in their efforts to carry out this important musketry practice.

In the course of the general report some interesting remarks are made as to the probable value of the South African campaign from a musketry point of view. It is already apparent from information received of the shooting by our men in this war that musketry generally must have made vast strides in the interval which has elapsed since the last time we were engaged with an enemy in that part of the world. No doubt some of this improvement is due to the better shooting powers of the Lee-Metford and Lee-Enfield rifles as compared with the Martini-Henry, but the chief improvement is due to the far greater care and trouble now taken with musketry training throughout the Army, and to the great advance made in the fire discipline of all ranks. Many points will be most interesting to notice in this connection. For instance, what kind of fire was most generally used and found most effective, whether "individual," "independent," or "volley"; also what were the most generally adopted "positions"—*i.e.*, "standing," "kneeling," "sitting," or "lying"; at what distances most of the firing took place, and whether long-range fire was much used and found effective; the uses to which machine guns were put, and their general behaviour; what revolvers were found the most suitable; also whether the present bayonet was much used and found to answer well, etc.

The following official instruction has been issued as an Army Order:—

"Her Majesty the Queen having deemed it desirable to commemorate the bravery shown by the Irish regiments in the recent operations in South Africa, by the formation of a regiment of Irish Foot Guards, has been graciously pleased to command that an Irish Regiment of Foot Guards be formed. This regiment will be designated the 'Irish Guards.'"

Authority has been given for two companies for the regiment to be formed at once from the battalions of Foot Guards now in London, both officers and men selected being Irishmen. The men will each receive a bounty of £2, and as soon as these companies are complete the formation of the other companies will be proceeded with as rapidly as possible. It is proposed, in the first instance, to quarter the companies as formed in St. John's Wood Barracks, the ultimate intention being that the battalion shall, as far as may be practicable, be stationed in Ireland

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ARGENTINE REPUBLIC.—The War Academy, which has lately been formed at Buenos Ayres, is instituted to prepare officers for the staff. Thirty first lieutenants or captains are received each year, who must fulfil the following conditions, viz., have served at least two years as an officer in an active unit, be well reported upon, and have successfully passed a written examination.

According to *El Porvenir Militar*, the examination consists of:—The solution of a tactical scheme of the arm to which the candidate belongs; an essay on field fortification; a historical essay on the Napoleonic period and the independence of South America; a geographical essay on South America; and a French essay. For these subjects the use of books and maps is forbidden; the candidate is allowed an entire day for each subject, the time taken by each in the composition being noted. Only a certain number of officers of each branch of the Service is admitted. The examination is held so as to allow successful candidates to reach Buenos Ayres on the 25th March. The Academy opens on the 1st April. Superior officers may be authorised to be present at certain courses, but if they wish to receive a staff certificate they must undergo the same obligations as captain and lieutenant pupils. The course lasts two years. The programme for the first year consists of:—Tactics, military history, artillery, field fortification, topography, general history, general geography, international law, French, and riding.

There are, in addition, four courses called optional, viz., telegraphy and optics as applied to war, mathematics, German, and explosives. Each pupil is obliged to take up two of these subjects.

The programme for the second year consists of:—Military history, applied tactics, fortification, staff duties, artillery, military hygiene, general history, general geography, French, and riding. In addition to these, there are two so-called optional courses, viz., geodesy and German, one of which is obligatory. The officers who pass out amongst the first five at the final examinations are permitted to travel to Europe to study at the expense of the Government.

AUSTRIA-HUNGARY.—In continuation of the note concerning the manœuvres in the JOURNAL for last month, two armies will be formed with the four army corps taking part in the Galician Manœuvres, between Jasto and Krosno. The following will be the four corps:—The Ist (Cracow), the VIth (Kaschan), the Xth (Przemysl), and the XIth (Lemberg). These will be formed in five army corps for manœuvre purposes.

One army will consist of three army corps composed of 2 infantry divisions each, and the other of two army corps of 3 infantry divisions each. Each company will be made up to a strength of 130 men, by means of reservists. The following will take part in the manœuvres, viz., 122 infantry battalions, 10 Jäger battalions, 20 cavalry regiments, 64 field and 8 horse artillery batteries. To these units must be added 34 Landwehr battalions, 13 Honved battalions, 3 Landwehr Uhlan regiments, and 1 or 2 Honved cavalry regiments. The grand total of these forces will amount to 179 infantry battalions, 72 batteries, and 25 cavalry regiments. The *Armeeblatt*, from which these details are taken, adds that such large forces have seldom previously taken part in the Austro-Hungarian manœuvres.

BELGIUM.—The *Belgique Militaire* states that the commission formed two years ago at Brasschaet to examine the various types of field gun submitted to it as suitable for adoption by the Belgian artillery has at last decided on a 3-inch gun constructed by a Belgian firm, the Société John Cockerill, on the system of Nordenfeldt of Paris. The breech is closed by a concentric screw, the carriage is rigid, having neither hydraulic brake nor a spade at the end of the trail, though there is a brake on the wheels. The total weight of the gun, including carriage and limber and 40 rounds of ammunition, is 1¾ tons. The weight of the projectile is 14·1-3 lbs., and the muzzle velocity 1,716 feet per second.

FRANCE.—M. Pelletan has just presented the report on the War Budgets made in the name of the Budget Commission.

This report is divided into two parts: The first part contains general observations on various branches of the Service; the second is devoted to an examination of the chapters.

The following are the chief criticisms passed by the Commission in their report, viz.:—

1. *Too many Officers employed at Head Quarters.*—The report nevertheless admits that the Intelligence Department, as well as the Records Section, have not sufficient *personnel*, if compared with the similar German services. The Commission is of opinion, on the other hand, that the Geographical Department employs too many officers.

2. *Exaggerated number of General Officers employed on Committees, Commissions, Inspections, etc., with regard to the Cavalry, Artillery, Engineers, and the Remount Department.*—The report advocates the suppression of committees, and appears to consider useless the permanent formation of cavalry divisions, which do not exist in Germany. On the other hand, the report is of opinion that military instruction does not receive the same attention in France as it does in neighbouring Armies.

3. *Exaggerated number of the Personnel of Departmental Services.*

4. *Using for all sorts of labour Soldiers who should be in the Ranks.*—The Commission officially admits one of the evils which for many years have been the object of the complaints of all company officers. It does not, however, suffice to point out the evil; steps should be taken to do away with it. There must always be shoemakers, saddlers, tailors, farriers, etc. If the soldier is not to be employed, proper workmen should be used, and the Budget does not allow for their payment.

5. *Bad Management of the Commissariat Department as regards Provisions and Forage.*—The report inveighs against the prices paid by departments—prices which are greatly in excess of the ordinary market rate.

6. *Bad Administration of the Clothing Department.*

—*Précis from Revue du Cercle Militaire.*

When, about twenty-five years ago, the French military authorities made the acquisition of road locomotives, they believed that they had found an engine that was to effect the heavy conveyances of the Army, and make up for the inadequacy of horses for the moving of bulky and weighty material. At this epoch it was a question of rapidly arming some newly-constructed forts with guns of considerable weight, which it was difficult and expensive to haul by ordinary methods, that is to say, by means of horses. What, then, were the stumbling-blocks in the way of the use of such engines, since they have disappeared from the service of the Army?

They were of several natures, and consisted principally in the excessive weight and the difficulty of manœuvring the locomotives, and the want of power in the boilers, which were, nevertheless, capacious. The weight of these road

locomotives of two different types (a large and small model), which was respectively 15 and 18 tons, involved the rapid deterioration of ordinary roads, and forbade them access to country roads of which the metallic bridges were incapable, in most cases, of supporting loads greater than 17,600 lbs., distributed over two axles.

The steering apparatus did not act quickly enough in a turning at right angles, and rendered the entrance into fortified works, with obstructed gates, drawbridges, etc., if not dangerous, at least very difficult. The want of power of the boiler necessitated numerous stoppages along the road for putting them under pressure; and in journeys upon roads that were somewhat broken, considerable reduction had to be made in the weight carried. Such as they were, however, the fact must be recognised that these road locomotives rendered numerous services in the carriage of heavy artillery material, since, when it is necessary to employ horses, the number of the latter must be so great for such manœuvres that, in turning about, the front teams no longer haul in a straight line, and it then becomes necessary to have recourse to the use of capstans, the manœuvring of which is lengthy and always difficult.

Things were in this state about ten years ago, when appeared the first steam automobiles of a relatively much lighter weight (5 to 6 tons) than their predecessors, and of at least equal power. Such results were due to the great improvement introduced into the processes of mechanical manufacture, and the use of steam at a high tension produced in new boilers with a rapid vaporisation under a small bulk.

When in the train of the different races and competitions that had taken place up to 1894, the Minister of War consulted the military commissions that had closely followed the progress that had been made, he found that they were of the opinion that the Scotte traction engine was the type of automobile that seemed to answer the requirements of the Army best. Some experiments of the most varied character were undertaken as long ago as the beginning of the winter of 1897, and were continued up to the course of the year 1899. They proved that the Scotte traction engines were capable of effecting all the conveyances required by armies in the field, and the carriage of siege parks and large pieces of artillery. A Scotte train composed of six carriages of artillery or military equipments, turns about and performs its revolutions within a radius of 11½ feet and is capable of passing over all the classified roads of France.

Here, then, we have a great problem solved, since we now have an engine which will advantageously replace horses, the number of which will continuously decrease, seeing the progress that automobilism is making. The advantages over animal traction are indisputable. In the first place, there is a reduction of about half in the length of the convoys upon the road, and a reduction in the *personnel* necessary for the new mode of traction, which will employ but 120 men, while for the same convoy animal traction requires 180. The guarding of the sides of these automobile convoys on a campaign would require but half the number of men as a consequence of a reduction of the length upon the road. In forced marches, since the mechanical motor does not become wearied, it would permit of more extended strategic movements, while ordinarily the latter have to be limited to the journey that horses can make in a given number of hours.

The following examples will make apparent the advantages of automobile traction in a still more striking manner. It has been proved that 25 Scotte traction engines are capable of supplying cartridges at 60 miles distance and in 18 hours, to an army corps of 60,000 men; and that it is possible to move in one night to a distance of 9 miles fifty 9-inch guns of the weight of 24 tons each.

If in 1870 the Prussians had engines of this kind at their disposal when they began the siege of Paris, they would not have had to wait three months and a half before being able to bring their guns into position. It was necessary at that

epoch to bring from Metz 960 carriages and more than 2,000 horses. The 2,000 carriages and the horses for which a requisition was made for duty around Paris, as well as the teams of the 3rd German Army, had great trouble to supply ammunition, for an attack that once begun could not be interrupted at any cost

As a traction engine replaces 32 horses, it will be seen that hardly more than 200 engines would have sufficed to permit them to begin the bombardment within but a few days after the invasion; and, as the defence had not been able to make sufficient preparations, the consequences would have been still more disastrous for us.

In future wars traction automobiles will necessarily be called upon to play a very important part in conveyances and the supply of armies in the field.—*Scientific American* from *La Nature.*

Garrison manœuvres, which have hitherto been executed only during the fine season, will in future take place at all periods of the year. In his instructions, General Gallifet attaches great importance to the fact that this species of military instruction should take place even during the winter months. He particularly desires that the training of the cadres and the old soldiers in out-door exercises should be carried out during the first period of the young soldiers' instruction. He maintains that the military authorities should not even wait for the conclusion of this first period before making the recruits take part in field manœuvres, the programme of which should be drawn up with regard to the amount of instruction already acquired.

This innovation will be put into practice in all branches of the Service without delay. Many of the territorial regiments which are liable to be called out this year will take part in winter exercises. Special instructions, now drawn up by the medical department, will point out the precautions to be taken to prevent sickness and accidents incidental to the training of young soldiers and reservists in the open air during winter.—*Le Progrès Militaire.*

La France Militaire in a recent number states that the French Government have definitely decided that the battery shall in future consist of four instead of six guns.

"We can assert," says that journal, "that this formation has been adopted in principle, and that it will be made the basis of a new scheme, shortly to be laid before Parliament, on the re-organisation of our field artillery." The battery will have 9 ammunition wagons.

The same journal then proceeds to justify the new formation by giving reasons explaining the adoption of this measure. It points out that it is intended to incorporate a regiment or brigade of artillery with the division, similar to what has been already done in Germany, and it argues as follows about the number of Q.F. guns which should be given to an army corps:—

"It has been proved that a captain is unable to personally supervise the fire of a battery of six Q.F. guns. It is also agreed that when each piece throws 20 projectiles a minute, the difference in time is almost inappreciable in the consecutive discharge of 100 shells by a battery of 4 or of 6 guns.

"With regard to the number of guns required for each army corps, the Germans have 144. It is proposed to give us only 120. The partisans of this second number assert:—Firstly: That the superiority of our fire being 20 shots a minute to the German 4, 120 guns are amply sufficient for each army corps.

"Secondly: That if the number was increased to 144 guns per army corps, it would require an increase in officers, men, and horses, which it would be difficult to obtain, however important such increase might be.

"Thirdly: That this increase of cadres, effectives, and teams would cause very considerable expenditure.

"The partisans of the first number reply:—Firstly: That the superiority of to-day with regard to rapid firing may disappear to-morrow.

"Secondly: That the troops going into action would be adversely affected if they knew that the enemy's artillery can place a greater number of guns in the field than ours can, for there is nothing to prove to them that the German artillery is technically inferior to ours.

"Thirdly. That the loss of one of our guns, on account of that very technical superiority, would have far greater importance on the field of battle than the loss of a gun to the Germans.

"Fourthly: That as far as regards the increase in the cadres, it would give promotion to artillery officers, who now have so little.

"Fifthly: That the increase in effectives and in teams would be greatly reduced by the adoption of mechanical traction for reserve ammunition columns.

"Sixthly: That expenses must be incurred in peace-time in order to avoid the risk of ruinous and irreparable disasters in time of war."

GERMANY.—*La France Militaire* observes that the Grand Manœuvres this year will be particularly interesting if it were only on account of the new field artillery organisation which will be seen put into practice for the first time. Each division of the two army corps will have its own artillery brigade of two regiments, always excepting the 41st Provisional Division, attached to the 2nd Army Corps to make up a third division, which will have only one regiment. In any case, there will be no corps artillery. It may also be remarked that the pioneer battalions will also be all split up amongst the divisions. There will be no extra divisional troops, with the exception of a balloon section, and for the Guards Corps a squadron of mounted Jägers, formerly called *Meldereiter*.

As regards the cavalry, a division will be attached to each army corps, and some regiments will be distributed unequally amongst the divisions of each corps; the two first divisions of each corps having a regiment of four squadrons, and the third a group of two squadrons only. This may perhaps be with the object of comparing these two methods of distribution and to determine the amount of cavalry really indispensable to an infantry division.

As regards the artillery, all interest will be concentrated on the new organisation, the question being if this organisation carries with it the definite suppression of corps artillery, or whether, in spite of its complete distribution amongst the various divisions, a portion of the batteries may not be diverted at a given moment, to act under different conditions, that is to say, either in conjunction with a division, or under direct orders of the army corps commander.

The organisation of army corps of three divisions is not perhaps foreign to this question of the distribution and the action of artillery. One of the reasons most frequently advanced to justify the necessity of corps artillery, was that with army corps of two divisions it was the only means the commander of the army corps had to constitute a species of reserve which he might make use of at a given moment to personally interpose in an action in one way or another. For with an army corps of two divisions it was impossible for him to engage with one alone, holding the other in reserve. To keep a reserve equal to half the effective would be too much, and to only take a brigade from one of the divisions for this purpose would mean the breaking up of that division in a regrettable manner. Thus the only reserve an army corps commander was able to retain for eventualities was the corps artillery. With an army corps of three divisions the situation is far otherwise, and the corps commander may very easily spare himself an effective reserve and keep it under his own immediate control. He might very possibly engage two divisions at first, and keep the third to guard against the unexpected, and to use it according to circumstances.

It is then very likely that the Germans mean, in the forthcoming Imperial Manœuvres, to experiment with the formation of three divisions per army corps at

the same time as with the new method of artillery distribution, that is to say, two questions, which are plainly bound up together. The experiment, in any case, cannot fail to be a most interesting one to follow. One will see by the results achieved, and even better by the steps which will be taken by the German military authorities, and the discussions after the manœuvres, in which direction German ideas point with regard to the constitution of large units.

A new edition of the Infantry Musketry Regulations, approved by the Emperor on the 16th November last, has just been brought out, and will immediately be put into force. The chief changes consist in the introduction of new targets (head and shoulders, head in a circle, and section targets), and in the suppression of certain others. It increases the conditions imposed on the firer, revives the limitations with regard to badges and musketry prizes, makes it compulsory for the firer to invariably use his own rifle during the musketry practices, and finally insists on the necessity for the frequent practice of the infantry in firing at medium ranges, between 600 and 1,000 metres, at low lines of skirmishers. It appears, too, that the sword bayonet is no longer placed on one of the sides of the rifle, but well underneath; this should do away with the deviations in firing incidental to the present mode of carrying the bayonet. It is thought that the new method will prevent the man from firing too high, which he is only too apt to do in moments of excitement and danger, which is just the very time when the bayonet would be fixed. The description of the rifle itself was given in the JOURNAL for June, 1899.

Dr. J. M. Woodbury, late Major and Chief Surgeon U.S.V., who as a United States Commmissioner observed last summer's field manœuvres of the German Army, has submitted to the War Department a report of the hygienic, sanitary, and medical arrangements of the Kaiser's military establishment. Dr. Woodbury found that the feet of the soldiers are most carefully considered, each man's feet being inspected by one of his company officers at least twice a week in barracks, and oftener in active field manœuvres. At the same time each man's socks and boots are carefully inspected as to the condition of cleanliness. The entire body of each man is inspected every thirty days by a company and a medical officer, careful search being made for heart lesions, hernia, venereal disorders, skin diseases, etc.

In the German Army, Dr. Woodbury says, there is no sick call. If any enlisted man falls ill or seems fo be unfit for duty it is reported to the first sergeant of his company. If on inspection the sergeant finds the man to be in need of medical care, if the case be in the barracks, he is retained in quarters until the medical officer makes his daily rounds, morning or afternoon; if in the field, he is picked up by a hospital bearer and taken to the field hospital. The record is kept by the first sergeant, and the man continues to be borne on the company strength, but as "off duty"; when he is returned he is simply marked for duty on the company books; the time that he has been away is stated as "in hospital." The medium sick and convalescents receive an issue of claret equivalent to half a pint of burgundy twice daily; for the serious cases spirits may be obtained, but only on the doctor's order.

The total weight of each man's equipment, pack and piece, is 60 lbs. The shelter tent is rolled and attached to the knapsack. No blanket roll, slung from shoulder to hip, is allowed. Each man carries his own cooking utensils, consisting of a tin canister, in which his provisions are packed. When the top or lid is removed, the bottom may be used as a kettle and the top as a coffee-pot. In the field two men usually mess together, one making soup in the bottom of his canister, which the other makes coffee in his, the tops being used as plates. There are no scraps and there is no waste. In the new equipment the provision canister is made of aluminium; it is carried on the top of the knapsack. There is no haversack. The quality of the food is excellent and the quantity is sufficient, being one

half pound of meat per day per man, a pound of fresh vegetables, a ration of split peas or beans for soup, and two ounces of coffee, chocolate, or cocoa. Tentage is small in amount; requisitioned quarters in the nearest village being always used, the Germans having a saying that their worst quarters are better than the best bivouac. They never use canvas when they can get the tight roof of a house. —*U.S. Army and Navy Journal.*

The *Armee-Verordnungsblatt* publishes the following regulations with reference to the granting of leave to German officers visiting France:—1. Leave to visit in the immediate neighbourhood of fortified places on the eastern French frontier, such as Verdun, Toul, Nancy, Épinal, Belfort, Rheims, and Langres, will only be granted in very special circumstances, such as the residence of near relations in the places visited. 2. Having regard to the French law of espionage of 18th April, 1886, each officer before going away on leave should be warned to hold himself strictly aloof from anything to which the slightest suspicion could be attached, and on no account to omit to record his correct name, position, and nationality in the visitors' list at the inns and police stations. 3. It is the duty of each officer within 24 hours of his arrival in a garrison town to give, personally or in writing, notice of his place of residence to the senior officer, or at the head-quarters, and in Paris also to the German Ambassador.

ITALY.—The *Gazzetta Ufficiale* lately published a Royal Decree re-organising the Colony of Erythrea.

The government of the colony is entrusted to a civil governor, who is nominated by the King, on the recommendation of the Minister for Foreign Affairs. This Governor is invested with all the powers that can possibly be delegated to him. He may decree a state of siege and create special tribunals. Asmara is fixed upon as the seat of Government.

The defence of the colony is entrusted to a corps of colonial troops, which consists of Italians and natives. This corps is commanded by an officer, appointed by the King on the recommendations of the Ministers of War and of Foreign Affairs, the Governor of Erythrea being previously consulted.

The commander of the forces has, as regards discipline, the same powers as a general commanding a division, but he is subject to the Governor's orders as far as the employment of the military forces for a political purpose is concerned. The naval forces in the waters of the colony must assist in its defence. The Governor alone is responsible for the intelligence department, the public safety, and the political correspondence with the central Government, with foreign authorities, and with Italian authorities abroad.

A district commissioner or resident is placed at the head of each of the districts into which the colony is divided.

The civil administration of the colony is carried out by 30 officers and 60 colonial clerks, divided into ten classes, 5 classes of officers whose emoluments range from £100 to £280, and 5 classes of clerks whose pay varies from £48 to £88 per annum. In addition to their pay, officers and clerks receive a colonial allowance of from £48 to £98; further, they have a right to a bounty on appointment varying from £8 to £40. The pay and allowances of the Governor of the colony amount to £1,000, the bounty paid to him on appointment is £200. The pay of the officer commanding the troops is £384 a year, the bounty paid to him on appointment being £80.

Officers of colonial troops receive the pay of their rank plus a colonial allowance and a bounty on first appointment. These two allowances are similar to those given to colonial civilian administrative officers.

The men receive in cash a daily pay of from 3½d. for the private soldier to 2s. for the sergeant-major. They receive in addition an annual bounty varying according to their length of service. This bounty amounts to £4 4s. for the first

year for the private soldier, to £6 2s. for corporals, and to £7 15s. for other non-commissioned officers. This bounty increases progressively so as to amount to £13 2s. and to £13 16s. respectively, in the fourth year. Such are the pay and bounty of the Italian troops. Italians serving with the native troops have marked advantages of pay. Thus, whilst a N.C.O. serving with Italian troops receives a daily pay of about 2s. in his first year and of 2s. 3d. in his fourth year's service, the N.C.O. serving with native troops gets 2s. 7d. during his first year and 3s. 10d. during his fourth year. The different corps receive for each soldier, no matter to what branch of the Service he may belong, and without regard to his rank, a lump sum of £3 12s. for his first equipment, and a daily rate of 1s. 1d. for food, clothing, and various necessaries.

Native officers serving with colonial troops receive a daily rate of pay varying from 3s. 4d. to 4s. 2d., according to their length of service. Mounted officers receive a daily allowance of 5d. Native N.C.O.'s receive from 2s. to 2s. 6d. daily, corporals from 1s. 4d. to 1s. 9d., private soldiers from 11d. to 1s. 4d. Natives serving in the cavalry squadron, the batteries, or the train company receive a fixed daily allowance of 1d. for all ranks.

The total effective strength of the Colonial Corps amounts to 239 officers and 6,512 N.C.O.'s and men, and of these 57 officers and 5,400 N.C.O.'s and men are natives. They are distributed as follows :—

—	Officers.	Rank and File.
Staff	13	20
Medical Service	10	60
Veterinary Service	3	3
Commissariat Department	6	60
Artillery Staff	4	96
Military Court of Justice	1	3
1 Company of Carabiniers	5	222
3 Companies Riflemen (Italian)	11	500
6 Native Battalions	144	3,714
1 Native Squadron	7	125
2 Native Batteries	8	374
1 Company of Native Gunners...	8	329
Native Military Train	3	307
1 Sapper Company (mixed)	7	297
1 Native Coast Company	9	402
Total	239	6,512

The following details of manœuvres have been officially decided upon for the present year :—

Field Manœuvres.—Will take place in all army corps from the 1st to the 12th September, in conformity with the regulations in force. But for the troops quartered in Sardinia the duration of field manœuvres is fixed from the 4th to the 15th June inclusive.

Cavalry Evolutions.—Two divisional camps will be formed for 25 days during the month of September : one in the 3rd and the other in the 5th Army Corps. Three brigade camps will also be formed during the same period for 20 days in the 1st, 8th, and 10th Army Corps.

Pontoon Drills.—From the 1st to the 20th August inclusive. Special instructions will be issued to the units interested.

Army Corps Manœuvres with Cadres.—The officers of the 2nd, 4th, 5th, 7th, 10th, and 12th Army Corps will take part in these.

Siege Manœuvres with Cadres.—Will be followed by cadres from the 1st, 9th, and 11th Army Corps.

Cavalry Manœuvres with Cadres.—Will take place in the 3rd, 8th, and 10th Army Corps districts with officers of the 3rd, 7th, and 9th Cavalry Brigades.

Cavalry Instruction Ride.—Will be under the direction of the Inspector-General of Cavalry, who will receive orders regarding them later.

Staff Ride.—The Chief of the Headquarter Staff will issue instructions for this ride, the date of which is not yet fixed.

A decree of the 22nd March last calls out a certain number of the reservist classes who are, for the most part, to reinforce the active units during the field manœuvres, and the territorial militia classes, who are called out between the months of May and October.

NETHERLANDS.—The number of young men who reached the age for military service in 1898 amounted to 46,285.

The classification was as follows :—

Unfit for Service	for deficiency in height	696
	on account of infirmities	4,196
Exempt	as only sons	5,095
	for other reasons	11,179
Debarred from service		70
Deceased between periods of drawing lots and Enrolment		37
Enrolled (509 in the Navy)		10,991
Young men who drew lucky numbers		14,021
Total		46,285

—*Bulletin de la Presse et de la Bibliographie Militaires.*

RUSSIA.—The *Russian Artillery Journal*, in considering the question of the effect of smokeless powder on the handling of artillery, pointed out that smokeless powder, in conjunction with increased range, had paved the way to perfection of artillery action, namely, the collective action of masses of artillery under the direction of one commander, a thing impossible in the days of black powder. It is now possible that artillery properly handled can open fire and attain its object without being discovered, but this can only be done by a skilful commander using to the utmost the nature of the ground so as to arrive at the required position undiscovered. Great stress is laid upon the necessity of moving under cover and the great superiority given to artillery suitably handled over other arms by the the invention of smokeless powder. On the other hand, the neglect of these precautions by an unskilful artillery commander must lead to disaster. The author says:—"It may be stated as a truism that under modern conditions of smokeless powder the open occupation of a position by artillery is nothing less than suicide." In concluding the first part of the article, the author considers the number of guns per 1,000 infantry, and points out that while the Prussians had 3 guns per 1,000 infantry in 1866, in 1870 they had 2·3 guns per 1,000 infantry. The right ratio is somewhere between these two.—*U.S. Army and Navy Journal.*

NAVAL AND MILITARY CALENDAR.

MARCH, 1900.

1st	(Th.)	Launch of sloop "Mutine" from Messrs. Laird's at Birkenhead.	
,,	,,	H.M.S. "Harrier" arrived at Plymouth from Mediterranean.	
,,	,,	Army Estimates issued.	
,,	,,	3rd Bn. Welsh Regiment (Militia) 3rd Bn. Royal Lancaster Regiment (Militia) Draft 3rd Bn. Grenadier Guards ,, 1st Bn. Coldstream Guards ,, 2nd Bn. Coldstream Guards ,, 1st Bn. Scots Guards ,, 1st Bn. Highland L.I. Detachment No. 7 General Hospital Yeomanry Hospital	Arrived at Cape Town from England in the "Majestic."
,,	,,	3rd Bn. Seaforth Highlanders (Militia) Draft 2nd Bn. Seaforth Highlanders Reservists 1st Bn. Cameron Highlanders Detachment No. 7 General Hospital	Arrived in Egypt from England in the "Simla."
,,	,,	4th Cavalry Brigade Staff 7th Dragoon Guards No. 3 Company A.S.C. No. 20 Company R.A.M.C. (B.C.) Draft 2nd Bn. Northampton Regiment	Arrived at Cape Town from England in the "Armenian."
,,	,,	No. 26 Company Dorset Yeomanry No. 27 Company Devon ,, No. 48 Company North Somerset Yeomanry 7th Bn. Staff Hospital Staff Veterinary Staff Machine Gun Section	Left England for South Africa in the "Manchester Merchant."
2nd	(F.)	H.M.S. "Edgar" left Plymouth for Hong-Kong with reliefs.	
,,	,,	No. 16 Company Worcestershire Yeomanry Remounts	Arrived at Cape Town from England in the "Kumara."
,,	,,	3rd Bn. Royal Scots (Militia) Draft Royal Engineers ,, Royal Warwickshire Regiment ,, Essex Regiment ,, Border Regiment Langman Hospital	Left Ireland for South Africa in the "Oriental."
3rd	(Sat.)	Draft Northumberland Fusiliers ,, 2nd Bn. Lancashire Fusiliers ,, 1st Bn. South Lancashire Regiment Detachment No. 5A General Hospital	Left England for South Africa in the "Tantallon Castle."

3rd (Sat.)	No. 42 Company Herts Yeomanry No. 44 Company Suffolk (2) Yeomanry No. 63 Company Wiltshire (3) Yeomanry No. 46 Company Irish (1) Yeomanry No. 54 Company Irish (2) Yeomanry Hospital Staff Veterinary Staff 12th Bn. Machine Gun Section Base Depôt Staff	Left England for South Africa in the "Cornwall."
,, ,,	Volunteer Company Duke of Cornwall's L.I. Volunteer Company Border Regiment Volunteer Company North Stafford Regiment Volunteer Company Shropshire L.I. Volunteer Company Essex Regiment	Left England for South Africa in the "Nineveh."
,, ,,	1st Bn. Cameron Highlanders left Egypt for South Africa in the "Simla."	
5th (M.)	General Gatacre occupied Stormberg without opposition.	
,, ,,	2nd Bn. Royal West Kent Regiment arrived in England from Egypt in the "Dunera."	
,, ,,	H.R.H. the Duke of Connaught inspected the 2nd Bn. Scots Guards, at Chelsea Barracks, prior to embarkation for South Africa.	
,, ,,	No. 7 Company Leicestershire Yeomanry No. 28 Company Bedfordshire Yeomanry No. 29 Company Denbigh Yeomanry Hospital Staff Veterinary Staff Remounts	Arrived at Cape Town from England in the "Kent."
,, ,,	6th Bn. Lancashire Fusiliers (Militia) Draft 2nd Bn. West Yorkshire Regiment ,, 2nd Bn. Yorkshire Light Infantry ,, 1st Bn. Suffolk Regiment ,, 1st Bn. Argyll and Sutherland Highlanders Detachment No. 8 General Hospital	Arrived at Cape Town from England in the "Malta."
,, ,,	Volunteer Company Royal Warwick Regiment Volunteer Company Norfolk Regiment Volunteer Company Suffolk Regiment Volunteer Company Royal Welsh Fusiliers Volunteer Company East Lancashire Regiment Volunteer Company Hampshire Regiment	Arrived at Cape Town from England in the "Doune Castle."
,, ,,	No. 23 Company Duke of Lancaster's Yeomanry No. 24 Company Westmoreland and Cumberland Yeomanry Hospital Staff Veterinary Staff	Arrived at Cape Town from England in the "Afric."

6th (T.) 4th Bn. South Staffordshire Regiment (Militia)
Detachment 4th Bn. Lancaster Regiment (Militia)
Detachment 6th Bn. Royal Warwick Regiment (Militia)
Detachment 3rd Bn. South Lancashire Regiment (Militia)
Detachment 4th Bn. Derbyshire Regiment (Militia)
Detachment 9th Bn. King's Royal Rifle Corps (Militia)
Detachment 3rd Bn. Durham L.I. (Militia)
Detachment 4th Bn. Argyll and Sutherland Highlanders (Militia)
Draft 2nd Bn. Royal Fusiliers
,, 2nd Bn. Royal Scots Fusiliers
,, 1st Bn. Royal Welsh Fusiliers
,, 2nd Bn. Somerset L.I.
Detachment No. 8 General Hospital
} Arrived at Cape Town from England in the "Arundel Castle."

7th (W.) H.M. the Queen gave orders that "in future, upon St. Patrick's Day, all ranks of H.M.'s Irish regiments shall wear, as a distinction, a sprig of shamrock in their head-dress, to commemorate the gallantry of Her Irish soldiers during the recent battles in South Africa."

,, ,, Lord Roberts completely routed the Boers at Poplar Grove, about twelve miles from Osfontein.

,, ,, 3rd Bn. South Wales Borderers (Militia)
Draft 16th Lancers
,, 2nd Bn. Royal Highlanders
,, 1st Bn. Connaught Rangers
Detachment No. 8 General Hospital
} Arrived at Cape Town from Ireland in the "Cheshire."

,, ,, Detachment R.E.
Draft 1st Life Guards
,, 2nd Life Guards
,, Royal Horse Guards
,, 6th Dragoon Guards
Remounts
Detachment No. 7. General Hospital
Field Hospital (American Section)
} Arrived at Cape Town from England in the "Narrung."

,, ,, No. 25 Company West Somerset Yeomanry
No. 53 Company East Kent Yeomanry
No. 59 Company Oxfordshire Yeomanry
Remounts
Detachment No. 9 General Hospital
} Left England for South Africa in the "Mahratta."

8th (Th.) General Clements occupied Norval's Pont.

,, ,, Mounted Infantry, 4th Cavalry Brigade Staff
Mounted Infantry, Rifle Company
Draft 1st Bn. Loyal North Lancashire Regiment
Draft Rifle Brigade
No. 9 General Hospital
} Left England for South Africa in the "Sunda."

8th (Th.) 13th Yeomanry Brigade Staff; No. 47 Company Duke of Cambridge's Own Yeomanry — Arrived at Cape Town from England in the "Dunvegan Castle."

9th (F.) H.R.H. the Prince of Wales inspected Nos. 51 and 52 Imperial Yeomanry (Paget's) Companies, and No. 67 Company (Lord Dunraven's Sharpshooters), at Chelsea Barracks.

,, ,, H.R.H. the Duke of Cambridge inspected the 2nd Bn. Grenadier Guards, at Wellington Barracks, prior to their departure for South Africa.

,, ,, Volunteer Company Devonshire Regiment; Volunteer Company Bedfordshire Regiment; Volunteer Company South Wales Borderers; Volunteer Company King's Own Scottish Borderers; Volunteer Company Welsh Regiment; Volunteer Company Northamptonshire Regiment; Volunteer Company Manchester Regiment — Arrived at Cape Town from England in the "Greek."

,, ,, 8th Hussars; Detachment 7th Dragoon Guards; Draft 5th Dragoon Guards; ,, 2nd Dragoons; ,, 5th Lancers; ,, 14th Hussars; ,, 18th Hussars; ,, 2nd Bn. Duke of Cornwall's L.I.; Detachment No. 20 Field Hospital — Arrived at Cape Town from Ireland in the "Norseman."

,, ,, Royal Engineers (Balloon Section); 4th Bn. Somerset L.I. (Militia); 3rd Bn. King's Own Scottish Borderers (Militia); 4th Bn. North Stafford Regiment (Militia); 3rd Bn. Leinster Regiment (Militia); Drafts — Left Ireland for South Africa in the "Kildonan Castle."

10th (Sat.) Her Majesty the Queen inspected the 2nd Bn. Scots Guards and the 2nd Bn. Grenadier Guards, at Buckingham Palace, prior to their departure for South Africa.

,, ,, The Victorian contingent of Bushmen (275) left Sydney for South Africa in the "Euryalus."

,, ,, 17th Lancers; Draft 2nd Bn. Lancashire Fusiliers; Detachment No. 8 General Hospital — Arrived at Cape Town from England in the "Victorian."

,, ,, 8th Division Staff; 3rd Bn. East Kent Regiment (Militia); Draft 2nd Bn. East Surrey Regiment; Detachment No. 9 General Hospital — Left England for South Africa in the "Moor."

10th (Sat.) Volunteer Engineer Section 1st Middlesex
Volunteer Engineer Section 1st Newcastle-on-Tyne
Volunteer Engineer Section 2nd Yorkshire
Volunteer Engineer Section 2nd Tower Hamlets
Volunteer Engineer Section 1st Durham
Volunteer Engineer Section 1st Yorkshire
Volunteer Engineer Section 1st Devons and Somersets
Volunteer Engineer Section 1st Hampshire
Volunteer Engineer Section 1st London
Volunteer Engineer Section 1st Sussex
Volunteer Company Royal West Surrey Regiment
Volunteer Co. Somersetshire L.I.
" " East Surrey Regiment
" " Royal Sussex Regiment
" " South Stafford Regiment
" " Oxfordshire L.I.
" " Middlesex Regiment
Machine Gun Detachment West Yorkshire Regiment
} Left England for South Africa in the "Tintagel Castle."

11th (S.) General Kelly-Kenny's Division drove the Boers from Driefontein at the point of the bayonet, killing 102 of the enemy and taking 40 prisoners.

" " Lord Roberts again sent messages to Kruger and Steyn concerning the grave abuse of the white flag, and asserting that if such abuse recurred he should most reluctantly be compelled to order his troops to disregard the white flag. He also informed them that three kinds of explosive bullets were found in Cronje's camp, and that he had requested that copies of his telegram should be forwarded to all neutral Powers.

" " Volunteer Company Royal Scots
Volunteer Company East Kent Regiment
Volunteer Company Royal Irish Regiment
Volunteer Company Royal Scots Fusiliers
Volunteer Company Cheshire Regiment
Volunteer Company Scottish Rifles
Volunteer Company Royal Highlanders
Volunteer Company Wiltshire Regiment
Volunteer Company Highland Light Infantry
Volunteer Company Argyll and Sutherland Highlanders
} Arrived at Cape Town from England in the "Gascon."

12th (M.) H.M.S. "Hussar" paid off at Devonport.

" " Officially announced that all remaining Militia Battalions will be embodied from 1st May next.

" " H.R.H. the Prince of Wales inspected the Staff of the Imperial Yeomanry Field Hospital at Devonshire House.

" " General French reached Bloemfontein and occupied two hills commanding the railway station.

" " No. 10 General Hospital left England for South Africa in the "Avoca."

" " Ammunition Column 8th Division
Regimental Staff R.E. 8th Division
5th Field Company R.E.
Draft 10th Hussars
Detachment No. 10 General Hospital
Remounts
} Left England for South Africa in the "British Prince."

13th (T.) H.M.S. "Ocean" left Devonport for Mediterranean.

" " Launch of first-class armoured cruiser "Askold" from Germania Yard, Kiel, for Russian Navy.

" " Lord Roberts occupied Bloemfontein, and the British flag was hoisted over the Presidency.

" " 3rd Bn. East Lancashire Regiment (Militia)
5th Bn. Royal Dublin Fusiliers (Militia)
Draft 2nd Bn. Seaforth Highlanders
No. 7 General Hospital
No. 3 Remount Depôt
} Arrived at Cape Town from England in the "Servia."

" " 4th Bn. West Yorkshire Regiment (Militia)
4th Bn. Middlesex Regiment (Militia)
Detachment No. 5A General Hospital
} Arrived at Cape Town from England in the "Austral."

" " No. 55 Company Northumberland Yeomanry
Veterinary Staff
Base Depôt Hospital
Yeomanry Bearer Company and Field Hospital
Remounts
} Left England for South Africa in the "Winkfield."

" " No. 66 Company Yorkshire Yeomanry
No. 56 Company Bucks Yeomanry
3rd Bn. Machine Gun Section
Detachment No. 9 General Hospital
Remounts
} Left England for South Africa in the "Hilarius."

" " No. 30 Company Pembrokeshire Yeomanry
No. 31 Company Montgomeryshire Yeomanry
No. 49 Company Montgomeryshire Yeomanry
No. 45 Company Dublin Yeomanry
9th Bn. Staff
Hospital Staff
Veterinary Staff
Machine Gun Section
Detachment 12th Bn. Staff
Remounts
} Left England for South Africa in the "Montrose."

14th (W.) H.M.S. "Beagle" paid off at Portsmouth.

,, ,, Volunteer Company Lincoln Regiment
Volunteer Company Leicestershire Regiment
Volunteer Company Yorkshire Regiment
Volunteer Company Gloucestershire Regiment
Volunteer Company West Riding Regiment
Volunteer Company York and Lancaster Regiment
Volunteer Company Gordon Highlanders
— Arrived at Cape Town from England in the "Guelph."

,, ,, 2nd Bn. East Yorkshire Regiment
1 Company Royal Anglesey Engineers (Militia)
1 Company Royal Monmouth Engineers (Militia)
Draft 2nd Bn. Norfolk Regiment
,, 2nd Bn. Lincoln Regiment
,, 2nd Bn. Bedford Regiment
,, 1st Bn. Royal Irish Regiment
Militia Detachments
Detachment No. 10 General Hospital
— Left England for South Africa in the "Nile."

15th (Th.) General Gatacre crossed Bethulie Bridge in spite of opposition, and occupied the village on the Orange Free State side of the river. Gallant feats to save the bridge from destruction successfully accomplished by Second Lieutenant R. S. Popham, (Derbyshire Regiment), and Captain P. G. Grant, Royal Engineers.

,, ,, Mounted Infantry 4th Cavalry Brigade (Mixed Company)
Mounted Infantry 4th Cavalry Brigade (Machine Gun Section)
Draft 1st Dragoons
Draft 19th Hussars
No. 20 Field Hospital
— Arrived at Cape Town from England in the "Sicilian."

,, ,, Volunteer Company Loyal North Lancashire Regiment
Volunteer Company Seaforth Highlanders
Volunteer Company Gordon Highlanders
12th Brigade Staff
— Arrived at Cape Town from England in the "Mexican."

,, ,, 2nd Bn. Scots Guards
Detachment No. 10 General Hospital
— Left England for South Africa in the "Britannic"

16th (F) H.M.S. "Pique" left Plymouth for China.

,, ,, 3rd Bn. Norfolk Regiment (Militia)
4th Bn. Cheshire Regiment (Militia)
Draft Derbyshire Regiment
No. 24 Field Hospital
No. 5A General Hospital
— Arrived at Cape Town from Ireland in the "Orotava."

,, ,, 17th Brigade Staff
2nd Bn. Royal West Kent Regiment
2nd Bn. Manchester Regiment
Draft 2nd Bn. Cheshire Regiment
,, 2nd Bn. South Wales Borderers
Militia Detachments
— Left England for South Africa in the "Bavarian."

16th (F.) A Detachment New South Wales Lancers arrived at Durban from Sydney in the "Australasian.'

" " Section Volunteer Engineers (Electrical)
Volunteer Company Royal Lancaster Regiment
Volunteer Company Lancashire Fusiliers
Volunteer Company Berkshire Regiment
Volunteer Company Royal West Kent Regiment
Volunteer Company King's Royal Rifle Corps
Volunteer Company North Stafford Regiment
Volunteer Company Cameron Highlanders
No. 27 Company Bucks Yeomanry
No. 51 Company (Paget's) Yeomanry
Detachment No. 21 Field Hospital
} Left England for South Africa in the "Tagus."

17th (Sat.) Strathcona's Horse left Halifax U.S. for South Africa in the "Monterey."

" " Volunteer Company 1st Bn. Northumberland Fusiliers
Volunteer Company 2nd Bn. Northumberland Fusiliers
Volunteer Company Liverpool Regiment
Volunteer Company West Yorkshire Regiment
Volunteer Company Worcestershire Regiment
Volunteer Company South Lancashire Regiment
Volunteer Company Derbyshire Regiment
Volunteer Company Yorkshire L.I.
Volunteer Company Durham L.I.
} Arrived at Cape Town from England in the "Avondal Castle."

" " Draft 2nd Bn. East Kent Regiment
" 2nd Bn. Devon Regiment
" 1st Bn. Royal Welsh Fusiliers
" 2nd Bn. Scottish Rifles
" 1st Bn. Royal Inniskilling Fusiliers
" 2nd Bn. East Surrey Regiment
" Duke of Cornwall's L.I.
" Derbyshire Regiment
" Northamptonshire Regiment
" Royal Berkshire Regiment
" Yorkshire L.I.
" Shropshire L.I.
Nos. 37, 43, and 44 Companies A.S.C.
No. 21 Bearer Company R.A.M.C.
Nos. 21, 22, and 23 Field Hospitals
} Left England for Sout Africa in the "Gaika."

" " 400 Yeomanry Remounts left England for South Africa in the "Ashanti."

17th	(Sat.)	Draft Royal Artillery ,, 1st Bn. Royal Scots ,, 2nd Bn. Royal West Surrey Regiment ,, 2nd Bn. Royal Fusiliers ,, 2nd Bn. Worcester Regiment ,, 2nd Bn. North Stafford Regiment Detachment No. 23 Field Hospital Remounts	Left England for South Africa in the "Custodian."
18th	(S.)	1st Bn. Worcester Regiment Draft 3rd Bn. Grenadier Guards ,, 1st Bn. Coldstream Guards ,, 2nd Bn. Coldstream Guards ,, 1st Bn. Scots Guards A.O.C. Detachment No. 21 Bearer Company R.A.M.C.	Left England for South Africa in the "Braemar Castle."
,,	,,	16th Brigade Staff 2nd Bn. Grenadier Guards Detachment No. 10 General Hospital	Left England for South Africa in the "Dunera."
19th	(M.)	H.M.S. "Europa" left Portsmouth for Australia with reliefs.	
,,	,,	Lord Kitchener occupied Prieska without opposition.	
,,	,,	The War Office announced that a certain number of commissions would be conferred upon officers in the H.A.C. and Volunteer corps.	
,,	,,	A French force assaulted and captured Inrah, in the Tidikelt district, north-east of the Sahara. Arab loss about 600 killed and 450 prisoners. French casualties 45 killed and wounded.	
,,	,,	No. 17 Company Ayr and Lanark Yeomanry No. 18 Company Lanark Yeomanry No. 19 Company Lothian and Berwick Yeomanry 5th Bn. Machine Gun Section 6th Bn. Staff Hospital Staff Veterinary Staff Machine Gun Section	Arrived at Cape Town from Scotland in the "Carthaginian."
,,	,,	3rd Bn. Royal Munster Fusiliers (Militia) Draft 2nd Bn. Royal Lancaster Regiment ,, 2nd Bn. Middlesex Regiment Detachment No. 5A General Hospital	Arrived at Cape Town from England in the "Sumatra."
,,	,,	1st Bn. South Stafford Regiment Draft 1st Bn. K. O. Scottish Borderers ,, 1st Bn. West Riding Regiment ,, 1st Bn. Oxford L.I. ,, 2nd Bn. Wiltshire Regiment No. 22 Bearer Company R.A.M.C.	Left Ireland for South Africa in the "Auranja."
20th	(T.)	Launch of Torpedo-boat Destroyer "Yatagan" at Nantes for French Navy.	
,,	,,	4th Bn. Bedford Regiment (Militia) 3rd Bn. West Riding Regiment (Militia) Draft Royal Engineers Nos. 1, 2, 3, 4, 5, 6, and 7 Remount Depôts Detachment 5A General Hospital	Arrived at Cape Town from Ireland in the "Goorkha."

20th (T.) Nos. 1 and 2 Companies Wiltshire Yeomanry
No. 3 Company Gloucestershire Yeomanry
No. 4 Company Glamorgan Yeomanry
1st Bn. Staff
Hospital Staff
Machine Gun Section
No. 33 Company East Kent Yeomanry
Nos. 34 and 35 Companies Middlesex Yeomanry
No. 36 Company West Kent Yeomanry
No. 20 Company Fife Light Horse, Yeomanry
11th Bn. Staff
Hospital Staff
Veterinary Staff
Machine Section
} Arrived at Cape Town from England in the "Cymric."

,, ,, 3rd Bn. Yorkshire Regiment (Militia)
Draft 1st Bn. Royal Scots
,, Devonshire Regiment
,, 1st Bn. Inniskilling Fusiliers
,, 1st York and Lancaster Regiment
,, Durham L.I.
,, Royal Irish Fusiliers
,, Gordon Highlanders
Base Depôt Staff
Remount Depôt No. 2
"Princess Christian's" Hospital
Draft A.O.C.
A.P.D. and Details
} Arrived at Cape Town from England in the "Assaye."

,, ,, Detachment 17th Lancers
"M" Batt. R.H.A.
Ambulance Column 4th Cavalry Brigade
Draft 6th Dragoons
Cavalry Remounts
Detachment No. 8 General Hospital
} Arrived at Cape Town from Ireland in the "Pinemore."

,, ,, 1st Bn. Royal Sussex Regiment
Mounted Infantry Contingent
Detachment R.A.M.C.
Detachment No. 7 General Hospital
} Arrived at Cape Town from Malta in the "Pavonia."

,, ,, Draft Northumberland Fusiliers
,, 2nd Bn. Lancashire Fusiliers
,, 1st Bn. South Lancashire Regiment
Detachment No. 5A General Hospital
} Arrived at Cape Town from England in the "Tantallon Castle."

,, ,, 2nd Bn. Highland Light Infantry arrived at Southampton from Ceylon in the "Jelunga."

21st (W.) Launch of river gun-boat "Vigilante" from Thornycroft's Yard for French Navy.

,, ,, 3rd New Zealand contingent arrived at Cape Town from Wellington in the "Knight Templar."

21st (W.) 3rd Bn. Royal West Surrey Regiment (Militia)
4th Bn. Scottish Rifles (Militia)
Draft R.E. (Telegraphs)
,, 2nd Bn. Royal West Surrey Regiment
,, 2nd Bn. Scottish Rifles
No. 8 General Hospital
} Arrived at Cape Town from England in the "Cephalonia."

,, ,, Draft Royal Artillery
,, 1st Bn. Essex Regiment
,, 1st Bn. Suffolk Regiment
Detachment No. 22 Bearer Company R.A.M.C.
Remounts
} Left England for South Africa in the "Siberian."

22nd (Th.) H.M.S. "Basilisk" commissioned at Sheerness.

,, ,, Launch of first-class armoured cruiser "Prinz Heinrich" from Imperial Dockyard at Kiel for German Navy.

,, ,, Lord Roberts sent out small columns in the Free State to accept submission from burghers.

,, ,, Pomroy, near Ladysmith, wantonly destroyed by fire by the Boers.

,, ,, 3rd Bn. Royal Scots (Militia)
Draft Royal Engineers
,, Royal Warwick Regiment
,, Essex Regiment
,, Border Regiment
Langman Hospital
} Arrived at Cape Town from Ireland in the "Oriental."

23rd (F.) H.M.S. "Hood" arrived at Plymouth from Mediterranean.

,, ,, 1st Bn. Cameron Highlanders arrived at Durban from Egypt in the "Simla."

,, ,, Part of Lumsden's Horse arrived at Cape Town from India in the "Lindula."

,, ,, No. 26 Company Dorset Yeomanry
No. 27 Company Devon Yeomanry
No. 48 Company North Somerset Yeomanry
7th Bn. Staff
Hospital Staff
Veterinary Staff
Machine Gun Section
} Arrived at Cape Town from England in the "Manchester Merchant."

24th (Sat.) H.M.S. "Harrier" paid off at Devonport.

,, ,, H.M.S. "Comus" arrived at Plymouth from North America.

,, ,, 3rd Bn Royal Munster Fusiliers (Militia)
Draft 2nd Bn. Royal Lancaster Regiment
,, 2nd Bn. Middlesex Regiment
Detachment No. 5A General Hospital
} Arrived at Cape Town from England in the "Sumatra."

,, ,, Volunteer Company Duke of Cornwall's L.I.
Volunteer Company Border Regiment.
,, ,, North Staffordshire Regiment
Volunteer Company Shropshire L.I.
,, ,, Essex Regiment
} Arrived at Cape Town from England in the "Nineveh."

,, ,, Part of second Canadian contingent arrived at Cape Town from Halifax in the "Milwaukee."

24th (Sat.) A fourth New Zealand contingent (440 Mounted Infantry) left Otago for South Africa in the "Gymneric" and the "Monowai."

" " Lord Lovat's Corps
No. 50 Company Hants Yeomanry
Detachment No. 10 General Hospital
Remounts
} Left England for South in the "America."

" " Draft Royal Engineers
" 1st Bn. Liverpool Regiment
" 1st Bn. Devonshire Regiment
" 1st Bn. Leicestershire Regiment
" 1st Bn. Manchester Regiment
" 2nd Bn. Gordon Highlanders
" 2nd Bn. Royal Dublin Fusiliers
" Royal Irish Fusiliers
" Connaught Rangers
Detachment No. 11 General Hospital
Edinburgh Hospital
} Left England for South Africa in the "Briton."

25th (S.) Draft Royal Artillery
" 2nd Bn. Somerset L.I.
" 2nd Bn. Royal Scots Fusiliers
Detachment No. 11 General Hospital
Remounts
} Left England for South Africa in the "Glengyl."

26th (M.) 1st Bn. King's Own Royal Lancaster Regiment arrived at Southampton from Singapore in the "Dilwara."

" " Second portion of Lumsden's Horse arrived at East London from India in the "Ujina."

" " Royal Engineers (Balloon Section)
4th Bn. Somerset L.I. (Militia)
3rd Bn. King's Own Scottish Borderers (Militia)
4th Bn. North Stafford Regiment (Militia)
3rd Bn. Leinster Regiment (Militia)
Drafts
} Arrived at Cape Town from Ireland in the "Kildonan Castle."

" " Draft 12th Lancers
" R.H.A.
Detachment No. 5 General Hospital
Remounts
} Arrived at Cape Town from England in the "Ottoman."

" " Edinburgh Militia Artillery Company
Durham " " "
Antrim " " "
Donegal " " "
Drafts
} Left Ireland for South Africa in the "Umbria."

27th (T.) H.M.S. "Goliath" commissioned at Chatham for China.

" " General Joubert died at Pretoria.

" " General Clements occupied Fauresmith without opposition.

" " A small force under Colonel Pilcher entered Ladybrand, but afterwards withdrew.

" " 1st Bn. Leinster Regiment (Royal Canadians) left Halifax, N.S., for England in the "Vancouver."

28th (W.) Launch of first-class armoured cruiser "Montcalm" at La Seyne, Toulon, for French Navy.

" " Launch of first-class armoured cruiser "Dupleix" at Rochefort for French Navy.

28th (W.) 8th Division Staff
3rd Bn. East Kent Regiment (Militia)
Draft 2nd Bn. East Surrey Regiment
Detachment No. 9 General Hospital
} Arrived at Cape Town from England in the "Moor."

" " No. 42 Company Herts Yeomanry
No. 44 Company Suffolk " (2)
No. 63 Company Wilts " (3)
No. 46 Company Irish " (1)
No. 54 Company Irish " (2)
Hospital Staff
Veterinary Staff
12th Bn. Machine Gun Section
Base Depôt Staff
} Arrived at Cape Town from England in the "Cornwall."

29th (Th.) H.M.S. "Cossack" commissioned at Chatham for East Indies.

" " H.R.H. the Prince of Wales inspected 4 Sharpshooter Companies and 1 Company of Paget's Horse at Chelsea Barracks.

" " Delagoa Bay award: Portugal to pay 15,314,000 francs (about £600,000), with interest at the rate of 5 per cent. from 25th June, 1889, to the date of payment, and £28,000 which had already been paid.

" " Draft Royal Scots Fusiliers
Draft Cheshire Regiment
Detachment No. 11 General Hospital
} Left England for South Africa in the "Rahaia."

30th (F.) H.M.S. "Comus" paid off at Devonport.

" " General Tucker's Division engaged the Boers near Brandfort, north of Bloemfontein and drove them from the kopjes which they held. British casualties about 200.

" " No. 25 Company West Somerset Yeomanry
No. 53 Company East Kent Yeomanry
No. 59 Company Oxfordshire Yeomany
Remounts
Detachment No. 9 General Hospital
} Arrived at Cape Town from England in the "Mahratta."

31st (S.) H.M.S. "Charybdis" commissioned at Devonport.

" " Launch of coast-defence battle-ship "Norge" from Elswick Yard for Norwegian Navy.

" " Launch of torpedo-boat destroyer "Pique" from the Forges et Chantiers de la Méditerranée, Havre, for French Navy.

" " The Boers ambushed and captured a British convoy and 7 guns near Thaba n'chu, east of Bloemfontein. They also took possession of the Bloemfontein waterworks and cut off the water supply from the town.

" " 4th Bn. Gloucestershire Regiment (Militia) left England for St. Helena in the "Goth."

" " 850 Remounts left England for South Africa in the "Rippingham Grange."

" " No. 69 Company Sussex Yeomanry
No. 73 Company (Paget's) Yeomanry
3rd Machine Gun Section
} Left England for South Africa in the "Delphic."

31st (Sat.)	Volunteer Engineer Section 1st Middlesex Volunteer Engineer Section 1st Newcastle-on-Tyne Volunteer Engineer Section 2nd Yorkshire Volunteer Engineer Section 2nd Tower Hamlets Volunteer Engineer Section 1st Durham Volunteer Engineer Section 1st Yorkshire Volunteer Engineer Section 1st Devon and Somerset Volunteer Engineer Section 1st Hampshire Volunteer Engineer Section 1st London Volunteer Engineer Section 1st Sussex Volunteer Company Royal West Surrey Regiment Volunteer Company Somersetshire L.I. Volunteer Company East Surrey Regiment Volunteer Company Royal Sussex Regiment Volunteer Company South Stafford Regiment Volunteer Company Oxfordshire L.I. Volunteer Company Middlesex Regiment Machine Gun Detachment West Yorkshire Regiment	Arrived at Cape Town from England in the "Tintagel Castle."

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: January and February, 1900. "The Defence of Admiral Montijo." "A Study of the Medical Service on board ship in Preparation for Battle" (*continued*). "Logical Disposition of the Motive Power in War-ships" (*continued*). "The Mercantile Marine." "B.N. Powder" (*continued*). "The River Chubut: Its Pilotage." "Range-Finders for Coast Batteries." "On Discipline."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 4. Pola: April, 1900.—"The Boiler Explosion on board the Austrian Torpedo-boat 'Adler.'" "Graphic Methods for the Astronomical Determination of Position at Sea." "The Progress in Photogrammetry." "Budget for the Imperial and Royal Navy for 1900." "The Small German Cruiser 'Gazelle.'" "The Brazilian Torpedo-cruiser 'Tamoyo.'" "The Swedish Naval Estimates for 1900." "Foreign Naval Notes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: January and February, 1900.—Have not yet been received.

FRANCE.—*Revue Maritime.* Paris: January, 1900.—"Across Tonkin: The River Claire." "The Security of Convoys." "The Defence of Convoys." "The

New English Royal Yacht." "The U.S. Cruiser 'Chicago.'" "The U.S. Battle-ship 'Kearsarge.'" "Progress of the Japanese Navy." "Meteorology of the Extreme East." "The Coal in the Donetz Basin." "Foreign Naval Notes." "The Mercantile Marine."

Le Yacht. Paris: 3rd March, 1900.—"Torpedo-boats and Pilotage." "Yachting Notes." "Historical Notices of French Ships of War: the 'Fabert'" (*continued*). "The Mortar-Avisos." "The Japanese Torpedo-boat Destroyer 'Niji.'" "The Mercantile Marine: French and Foreign." 10th March.—"Our Naval Power." "Yachting Notes." "The Turbine Torpedo-boat Destroyer 'Viper.'" "The Newfoundland Fleet in Fécamp Harbour." 17th March.—"Corsaire-Cruisers: The Cruisers that We Want." "Yachting Notes." "Historical Notices of French Ships of War: The 'Brandon'" (*continued*). "The Japanese Destroyer 'Shiruani.'" "The Mercantile Marine: French and Foreign." 24th March.—"Our Naval Matériel: Its Superiority in certain points." "Yachting Notes." "Historical Notices of French Ships of War: The 'Océan'" (*continued*). "The Trials of the 'Chateaurenault.'" "The Rule of the Road and its Application to Squadrons." 31st March.—"The late Vice-Admiral Baron Duperré." "Yachting Notes." "Launch of the 'Montcalm,' 'Dupleix,' and 'Yatagan.'" "The Japanese Battle-ship 'Shikishima.'" "The Mercantile Marine: French and Foreign."

Le Moniteur de la Flotte. Paris: 3rd March, 1900.—"The Crisis in the Engineering Department." "The Naval Estimates." "The Navy in Parliament." "The English Naval Estimates." "Colonial Notes." 10th March.—"The Crisis in the Engineering Department." "The Naval Estimates." "New English Naval Constructions." "A National Work." "Colonial Notes." 17th March.—"The Battle-ships." "The Navy in Parliament." "Colonial Notes." 24th March.—"The Colonial Army." "The Navy in Parliament." 31st March.—"The Navy League." "Lecture by Capitaine de Vaisseau Houette." "The late Vice-Admiral Baron Duperré." "The Navy in Parliament."

La Marine Française. Paris: March, 1900.—"An Open Letter to Admiral Rieunier." "The Cost of Ships of War in France and England" (*continued*). "The Flotilla of Napoleon." "The English Navy: a Recent Trial." "The Programme of Reforms." "The Future of the Auxiliary Navy."

GERMANY.—*Marine Rundschau.* Berlin: April, 1900.—Frontispiece: "The Russian Cruiser 'Askold.'" "What the Athenian Democracy owed to their Command of the Sea." "The Turkish Navy from its Infancy." "From the East Indian Station." "Proverbs and Proverbial Methods of Speech about Seamanship, Sea and Fishing Life in the German Language" (*continued*). "A Contribution to the Theory of the Resistance of Water to Ships." "Water-gas and its Use." "The Survey of Kiou-Chou."

ITALY.—*Rivista Marittima.* Rome: March, 1900.—"Lessons from the Spanish-American War." "A Recent Publication by M. Lockroy." "The Dominion in the Mediterranean during the Second Mediæval Period." "Some Elements of Weight in Ships of War." "The Education of Sentiment in the Italian Navy." Letter to the Editor:—"On the Pointing of Guns in a Naval Action." "Foreign Naval Notes."

PORTUGAL.—*Revista Portugueza, Colonial e Maritima.* Lisbon: March, 1900.—"French Blood in the Boer Race." "Colonial Agriculture" (*continued*). "Some Brief Reflections on the Portuguese Navy." "The Portuguese Mercantile Marine." "South Africa and the Anglo-Boer War." "On the German Colonies."

SPAIN.—*Revista General de Marina.* Madrid: April, 1900.—"The Spanish Navy League." "Introduction to the Study of Naval Tactics." "Maritime

Defence of the Balearic Islands." "The *Points d'Appui* of the Fleet in their General Aspect." "Krupp Mountings (Central Pivot) for Q.F. Guns." "Calculation of the Luminous Power of Lighthouses." "A New Type of Fighting-Ship." "Coast Defence." "English Modern Ships of War."

MILITARY.

AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 8th March, 1900.—"Army and Parliament." "Offensive Warfare." "The War in Africa" (*continued*). 16th March.—"Admission to Military Educational Establishments." "English Transport Facilities." 24th March.—"Freiherr von Beck." "When does the New Rate of Pay Commence?" "Garrison Changes and Transfers." "Manœuvres in 1900."

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: March, 1900.—"Efficiency of Small-Calibre Weapons." "Application of a Goniometrical Apparatus for the Indirect Measurement of Lateral Deflection in Projectiles." "Immediate Results of the South African War."

Organ der Militär-wissenschaftlichen Vereine. Vienna: March, 1900.—"The Operations in the South-West of France until the Armistice."

BELGIUM.—*Bulletin de la Presse et de la Bibliographie Militaires* Brussels: 15th March, 1900.—"The New German Field Artillery" (*continued*). "The Anglo-Boer War" (*continued*). "Prince Frederick of the Netherlands and his Times." 31st March.—"The Anglo-Boer War" (*continued*). "Prince Frederick of the Netherlands and his Times" (with map—*continued*). "Practical Instruction of Troops and Cadres."

FRANCE.—*Revue du Cercle Militaire.* Paris: 3rd March, 1900.—"Garrison Libraries." "The War in the Transvaal" (*continued*). "The War Game in Corps" (*concluded*). "The Military and Naval Year—England." 10th March.—"The War in the Transvaal" (*continued*). "Garrison Libraries" (*continued*). 17th March.—"Autumn Manœuvres." "The Austrian Grand Manœuvres of 1899—The IIIrd and XIVth Army Corps in Carinthia" (with sketch). "The War in the Transvaal" (*continued*). 24th March.—"Autumn Manœuvres" (*concluded*) "The War in the Transvaal" (*continued*). "The Austrian Grand Manœuvres of 1899—The IIIrd and XIVth Army Corps in Carinthia" (with sketch, *concluded*). 31st March.—"German Field Artillery in 1900" (with sketch). "The War in the Transvaal" (with sketch, *continued*). "The United States Military and Naval Year."

Le Spectateur Militaire. Paris: 1st March, 1900.—"Studies of Applied Tactics—The Attack of St. Privat, 18th August, 1870" (*continued*). "From the Cape to the Zambesi" (1 sketch, *continued*). "The Officers of the Reserve and of the Territorial Army of the Triple Alliance" (*continued*). "The German War Budget and Military Regulations before the Reichstag in 1871 and in 1899" (*continued*). "The Campaign of 1866" (1 sketch—*continued*). 15th March.—"Studies of Applied Tactics—The Attack of St. Privat, 18th August, 1870." "Considerations for the Defence of Algeria-Tunis and the African Army" (*concluded*). "The German War Budget and Military Regulations before the Reichstag in 1871 and in 1899" (*continued*). "The Officers of the Reserve of the Territorial Army of the Triple Alliance" (*concluded*). "The Campaign of 1866" (1 sketch, *continued*).

Revue d'Artillerie. Paris: March, 1900.—"Distribution of Artillery Fire" (*continued*). "Field Service Exercises by Battery Groups" (*continued*). "Q.F. Guns in the English Coast Artillery."

Journal des Sciences Militaires. Paris: March, 1900.—"Fin de Siècle Promotion" (*continued*). "Battles of Napoleon." "Organisation and Instruction

of Cavalry." "Study on the Organisation of Coast Defence" (*concluded*). "Instructional Staff Rides for Officers in the German Army." "Mountain Warfare" (*concluded*). "Feeding of the Army" (*continued*).

Revue Militaire. Paris: March, 1900.—"The Present Position of the English Army." "The German Imperial Manœuvres of 1899" (*concluded*). "Railways of South-Western Asia." "Tactics of the German Field Artillery." "Combined Manœuvres of the German Railway Troops." "Coast Defence" (*continued*). "The Campaign of 1809 in Germany and Austria." "The War of 1870-71—History of the IIIrd Army Corps."

Revue de Cavalerie. Paris: March, 1900.—"The Employment of Fire by Cavalry." "The Cavalry of the Ist and IInd German Army Corps from the 7th to the 15th August, 1870, by Lieut.-General von Pelet-Narbonne" (*concluded*). "Notes on Military Training" (*concluded*). "A German Opinion on French Equitation."

Revue du Génie Militaire. Paris: March, 1900.—Has not yet been received.

GERMANY.—*Deutsche Heeres-Zeitung.* Berlin: 3rd March, 1900.—"General von Stosch and General von Stiehle." "Moltke's and Napoleon's Operations." "From the South African Seat of War" (*continued*). 10th March.—"A French Opinion on the German Naval Policy." "The German Fortress Artillery." "From the South African Seat of War" (*continued*). "The Case of Colonel Spoler against the *Militär-Wochenblatt*." 17th March.—"A Word from the Army on the Naval Estimates." "The Re-organisation of the Portuguese Army." "Hermann von Boyen—a discussion." "From the South African Seat of War" (*continued*). 24th March.—"Assaults on Fortified Field Works in the Boer War." "The Battles before Belfort in January, 1871." "From the South African Seat of War" (*continued*). 31st March.—"Progress of Military and Naval Strength of the United States." "The Netherlands Cavalry." "Assaults on Fortified Field Works in the Boer War" (*continued*). "From the South African Seat of War" (*continued*).

Internationale Revue über die gesammten Armeen und Flotten. Dresden: March, 1900.—"Changes in Belgian Artillery Organisation." "The Danish Naval Staff." "Military News about Germany, France, and Great Britain." *4th Supplement.*—"The Year 1899 in its Military Importance for Russia." "The Russian Fleet." "The Japanese Army and Navy." *5th Supplement.*—"The Development of the American Army." *French Supplement.*—"Lessons to be Drawn from the Transvaal War." "Winter Manœuvres." "The Importance of the German Naval Shipbuilding Programme."

Militär-Wochenblatt. Berlin: 3rd March, 1900.—"Hanoverian Ceremonial and Parade Marches." "The Russo-Asiatic Railway and its Military Importance" (*concluded*). "England and the Transvaal" (*continued*). 7th March.—"A New Work about the Battle of Hohenfriedeberg." "Gossip about Riding." "Hanoverian Ceremonial and Parade Marches" (*concluded*). "Q.F. Gun in Austria." 10th March.—"Military Opinions with regard to the Combined Action of Land and Sea Powers." "England and the Transvaal" (*continued*). 14th March.—"Boers and Poles." "Official Cross-Country Riding." "The New Year's Parade of English Troops in the State of the Nizam of Hyderabad on the 1st January, 1900." "Strength of the Swedish Army and Navy for 1900." 17th March.—"The Founders of the former Royal Hanoverian Army." "England and the Transvaal" (*continued*). "Field Artiilery Gunnery Instruction." 21st March.—"The Founders of the former Royal Hanoverian Army" (*concluded*). "Modification of the Age Limit for the Retention of Officers in the Russian Service." 28th March.—"Military Strength of France." "The Austro-Hungarian General Staff." 31st March.—"The Plinzner System and Military Riding." "England and the Transvaal" (*continued*).

Jahrbücher für die Deutsche Armee und Marine. Berlin: March, 1900.—"The 3rd Cavalry Division in the War of 1870-71" (*continued*). "From the War of 1807-14: Notes of a Danish Officer, published by his Daughter." "Privateering." "Russia's latest Railway Projects in Mid-Asia and Persia." "The Armed Strength of Honduras." "Effective Strength of Infantry Companies in France." "Military and Naval News from Russia."

Neue Militärische Blätter. Berlin: February, 1900.—"Opinions on the Training of Horse and Driver in the Field Artillery." "Frontier Protection." "Condition of Columbia's Army." "Military Scenes in Peace-time in the Old Prussian Army—1763-1806" (*continued*). "Recollections of a Journey in Russia in the Summer of 1899 (*continued*)." "France in Africa." "Shelter-trenches in the Spanish-American War." "Comparison of the Fighting Value of the Principal Fleets." "Losses in Future Wars."

March, 1900.—"Recollections of a Journey in Russia in the Summer of 1899" (*continued*). "France in Africa." "Military Scenes in Peace-time in the Old Prussian Army—1763-1805" (*continued*). "Infantry Musketry Regulations for 1899" "Fortified Positions by the light of military events in 1898 and 1899" "The British Officer" "This Year's Manœuvres of the French 6th and 20th Army Corps on the Western Frontier."

ITALY.—*Rivista di Artiglieria e Geniv.* Rome: February, 1900.—"Technical Artillery and Fighting Artillery." "The Solution of the Coast Problem of To-Day." "Some Ideas for the Complete Instruction of Field Artillery." "The Efficacy of the New German Field Gun." "The Best Method of Removing Earth and Conveying Material in the Construction of Works." "The Central School of Firing for the German Foot Artillery." "Recent Progress in Electrical Industries." "An Automatic Pistol now being tried in Switzerland."

Rivista Militare Italiana. Rome: March, 1900.—"King Charles Albert." "Moltke's Views on the Invasion of Bohemia in 1866." "The War in South Africa." "The Cavalry: What it is and what it ought to be" (*continued*). "Soldiers' Songs" (*concluded*). "The Austro-Hungarian Army in 1900."

RUSSIA.—*Voïénnyi Sbórnik.* January, 1900.—"Our Cossack Troops." "Criticism of the Tactical Operations of the English Army." "Present Situation of the Question of the Organisation and Proportion of Cavalry." "Order of Battle of a Field Battery." "General Insurance for Officers." "Souvoroff in Russian Literature." "Military Review of 1899 as regards the Powers of Western Europe."

February.—"The 34th Infantry Sievsk Regiment at Shipka and its March on Constantinople." "Expeditions to Siberia before the 16th Century." "The Musketry Question in Foreign Armies." "The South African War." "The *Monorail* System and its Military Application." "Notes on Artillery." "National Musketry Instruction." "Training of Troops in the German Army." "Souvoroff in Russian Literature" (*continued*). "Questions on the Military Organisation of the Day in Germany, Austria-Hungary, and France."

March.—Not yet received.

SPAIN.—*Memorial de Ingenieros del Ejército.* Madrid: February, 1900.—"The Entrance Examination to our Academy." "Proposed Method for Obtaining Natural Ventilation in the Halls and Dormitories of the Artillery Quarters at Melilla" (*continued*). "Optical Telegraphy: How Light and Time are lost in the Mangin and Analogous Systems" (*continued*).

Revista Técnica de Infantería y Caballería. Madrid: 1st March, 1900.—"The French Alpine Troops" (*continued*). "Camps of Instruction and Firing Practice in Germany" (*continued*). "The Motives of War." "The Russian

Soldier." "The Anglo-Boer War." "A Projected Company Cart." "The Previous History of the South African Question." 15th March.—"Pay and Promotion" (*continued*). "The French Alpine Troops" (*continued*). "Explosive Bullets." "The Military Districts in Russia." "Napoleon III. at Sedan." "The Moral Education of the Soldier."

SWITZERLAND. — *Revue Militaire Suisse.* Lausanne: March, 1900.—"Infantry Instructions for Field Firing" (*concluded*). "Fortifications in Austria-Hungary" (*concluded*). "Mobile Siege Artilleries and Swiss Artillery of Position."

NOTICES OF BOOKS.

From Cape Town to Ladysmith. By G. W. STEEVENS. 8vo. London: Messrs. Blackwood. 1900.

This posthumous work of Mr. Steevens is especially interesting, not only on account of the details it furnishes of the daily life at Ladysmith during the siege, but also because it is the last writing of a correspondent and journalist of unusual merit. The book is both humorous and pathetic. The greater portion of it deals with the fighting round Ladysmith and the diary of the siege. Almost the last words written were "O Lord! how long?" The end was not long in coming for the writer, for he died of enteric about three weeks before the town was relieved. No one can read Mr. Steevens' book without a sorrowful thought for the premature ending of a life so full of the brightest promise.

Handbook of Public Health, Laboratory Work, and Food Inspection. By O. W. ANDREWS, M.B., etc., Staff-Surgeon, R.N.

This useful little book is made up from a series of lectures, delivered by the author at Haslar Hospital, when he was doing duty there as one of the instructors to the surgeons on entry into the Navy, and it deals with the points to be observed in the inspection of fish, flesh, and fowl intended for human food, in an effective and masterly way. Chapter III. on fish, which is profusely illustrated, chiefly with drawings of species believed to be poisonous, is especially interesting. One species, the *Clupea thryssa*, is so excessively poisonous that people are said to have died with the fish in their mouths unswallowed. Interesting details are given of many cases of acute poisoning following the eating of certain kinds of fish, and the sailors' rule of regarding all fish without scales as being unwholesome is regarded as good, although it is not without exceptions. Of particular value are the remarks on the numerous diseases of animals rendering the flesh unsuitable for human food, especially those on tuberculosis, to which the author has devoted great attention. As the meat, etc., for the Navy is as a rule inspected on board ship by the paymaster and an executive officer, this little book should prove of great service to officers who have to carry out this duty, and we hope that it will find a place in all ships' libraries. Dr. Andrews is to be congratulated on having produced a valuable little work.

Towards Pretoria. By JULIAN RALPH. 8vo. London: C. Arthur Pearson. 1900.

Mr. Ralph, who is a war correspondent of the *Daily Mail*, gives a fine pen-picture of the war in South Africa as it really is. The book is very ably written, and cannot fail to be of the greatest interest. It appears at a most opportune moment.

Lessons of the War. By SPENSER WILKINSON. Crown 8vo. London, 1900.

A Brief History of Eastern Asia. By T. C. HANNAH. Crown 8vo. London, 1900

Bullet and Shot in Indian Forest, Plain, and Hill. By C. E. M. RUSSELL. 8vo. London, 1900.

Histoire de la Marine Française. 4 vols. By E. CHEVALIER, Capitaine de Vaisseau. 8vo. Paris, 1877, 1886, 1886, and 1899.

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Operations of the Mohmand Field Force in 1897. Compiled in the Intelligence Branch, Q.M.G.'s Department, by Captain F. A. HOGHTON, 1st Bombay Infantry (Grenadiers). Fcap. fol. Simla, 1899.

Kriegsgeschichtliche Einzelschriften. Parts 24 to 27. Published by the German Grand General Staff. 8vo. Berlin, 1898-99.

Kriegsgeschichtliche Beispiele aus dem Deutsch-Französischen Kriege von 1897-71. By KUNZ. Parts 1 to 11. Berlin, 1897-1900.

Eighteen Years in the Khyber. By Sir ROBERT WARBURTON. 8vo. London, 1900.

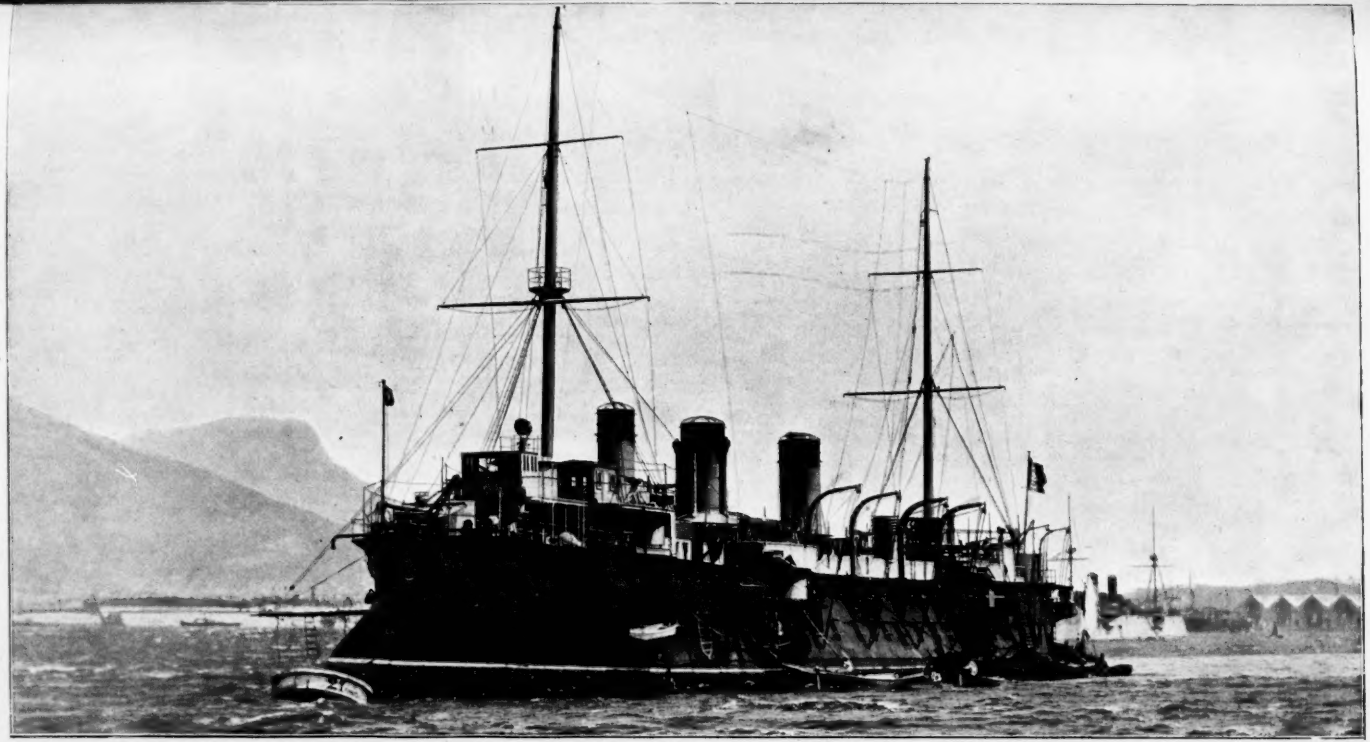
Die Lehre vom Kriege. By SCHERFF. 8vo. Berlin, 1897.

African Incidents. By Major A. B. THRUSTON. 8vo. London, 1900.

The British Army. By a LIEUT.-COLONEL. 8vo. London, 1899.

The Downfall of Spain. By H. W. WILSON. 8vo. London, 1900.

Dokumentarisch-Kritische Darstellung der Strategie für die Schlacht Vionville—Mars la Tour. By FRITZ HOENIG. 8vo. Berlin, 1899.



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